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Looks at NCC

Ford to Address NCC on Privacy

By E. Drake Lundell Jr.
Of the CW Staff

CHICAGO – The results of the Nixon Administration's review of privacy in data bank systems may be outlined publicly for the first time by Vice-President Gerald R. Ford in a special address to the 1974 National Computer Conference here May 6-10.

Ford, who is scheduled to address the convention on Thursday, May 9, is heading the administration's efforts to come up with guidelines in the area and has promised to share his "views and perspectives" on the issue with the computer community during the address.

However, the technical program for the convention appears to reflect a decreasing interest in social implications of computer use and an increasing emphasis on industry-oriented applications.

In announcing the speech by the Vice-President, press secretary Paul Miltich said, "The increasing utilization of computer technology and data processing applications has contributed significantly to the strength of our economy and to the creation of a host of new consumer services.

"At the same time," he added, "the widespread use of computers has given rise to legitimate concerns. In line with this, and in keeping with his position as chairman of the Domestic Council Committee on the Right of Privacy, the Vice-President looks forward to sharing his views and perspectives with the computer community and with the American public."

Technical Program

A record 119 sessions make up the technical program which is organized into 15 major subject areas – 10 on major industry applications and five on computer science and technology.

Major discussion of the social implications of computer use have been relegated to two special sessions outside of the regular program – one dealing once again with the issue of privacy in data bank

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On the Inside This Week

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State DP Consolidation on a Rocky Road

MASSACHUSETTS

Court Finds Plan Unconstitutional

By E. Drake Lundell Jr.
Of the CW Staff

BOSTON – The idea of a state centralizing computer operations received a setback here last week when a state Supreme Court banned the practice.

The Massachusetts Supreme Judicial Court declared that a plan to consolidate all state government data processing into one system was unconstitutional.

The move, which could set a precedent for other court actions, found the plan violated the doctrine of separation of powers since it would have called for a single data processing system to serve both the legislative and executive branches of state government.

"The potential for dangerous concentration of indirect but very real control over all branches of government inherent in such legislation is substantial," the court said in its decision.

The plan, which had been supported by

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ARIZONA

Governor, Senator Split on Legislation

By Alexander Dumas
Of the CW Staff

PHOENIX – Recently proposed legislation designed to centralize the state's data processing systems has brought a direct confrontation between the governor and a state senator on the issue of privacy.

Governor John R. Williams has said that any DP centralization poses clear "threats to the rights of Arizona's citizenry."

The companion bills sponsored by state Sen. David Kret provide for a "controls committee" to oversee the security of the centralized system, Kret noted. In addition, the legislation provides that only "political subdivisions" of the state can use the system.

"Now," Kret explained, "many different departments of the state have their own computers. There is much duplication of work and, as a result, wasted tax money. Many problems arise because the tax department, for example, doesn't

(Continued on Page 2)

LOUISIANA

'Political' Problem Besets Projects

By Patrick Ward
Of the CW Staff

BATON ROUGE, La. – The State of Louisiana seems to be backing away from its ambitious plans for DP centralization [CW, July 4, 1973] amid political infighting and complaints from user departments.

There are "people who want their own little independent computer kingdom," remarked a spokesman from the administration department, which contains one of the state's two major data centers.

The state revenue department, for one, apparently wants its own computer rather than continuing to rely on the administration department's facility.

"This is purely a political problem," the administration department spokesman said. "The revenue department didn't like relinquishing control of the data processing and although they were responsible for the program and all the input . . . they wanted their own toy."

The commissioner of administration plans to recommend that the revenue department be given its own computer to "remove a thorn from his side," the spokesman added.

No one in the revenue department would comment on why the department decided to buck the trend toward centralization until after the joint legislative budget committee decides whether to allot funds for a computer.

"We had valid reasons," was all one department official would say.

The revenue department formerly used a Univac 494 in the administration department to process only a small part of its total workload, most of which it handled manually.

But last year, the revenue department decided to automate a much larger pro-

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CDC Ties 200M-Byte Disk To 360/370—Ready by June

By Vic Farmer
Of the CW Staff

MINNEAPOLIS – Control Data Corp. has interfaced its 200M byte/spindle disk system to the IBM 370 and large 360 CPUs, and unlike other plug-compatible suppliers, CDC has scheduled installations starting in June.

The main holdup in independent installations of 3330-11-type disk replacements has been a desire by most independents to have compatibility with IBM media, but CDC has shuffled media compatibility aside. In short, the CDC equipment has all the basic operational characteristics of the 3330-11 but the disk pack is formatted in two logical volumes as opposed to IBM's single logical volume. CDC sees no programming problems with this arrangement.

CDC is working on eventual conversion to IBM compatibility but feels that such conversion may take an additional year after IBM releases the 3330-11 specifications.

IBM had scheduled first shipments of its 3330-11 for March and the first units were shipped March 29 but have not been installed yet.

The CDC 33302 drive attaches to the CPU block multiplexer channel, and no software modifications will be necessary, CDC said, because the 33302 uses the same command set as the IBM 3330 system.

A similar 200M-byte disk system for attachment to CDC mainframes will probably be included in the Cyber 170 system announcement scheduled for this week.

The CDC 33302 disk system can have up to 32 spindles in a four-string (eight drive/string) configuration by means of four-channel and string-switch options. This maximum configuration yields a total capacity of 6.4G bytes of on-line storage per controller.

Other features of the CDC 33302 include rotational position sensing which permits the channel to disconnect during rotational delay, average latency of 8.4 msec and a 3,600 rev/min disk speed.

Error correction coding circuitry in the controller detects and corrects data errors up to 11 bits in length on a single track, CDC said.

Maintenance of the system's control

(Continued on Page 6)

ACM Fights for Guides On Export of Technical Data

By H.R.J. Grosch
Of the CW Staff

WASHINGTON, D.C. – In an apparent effort to head off strict, unworkable controls over the export of computer knowledge overseas, the Association for Computing Machinery last week volunteered to help the Council on International Economic Policy develop "practical" guidelines in the area.

Increased restrictions on the export of technical information could cause problems for computer users and researchers in the U.S. as well since restrictions on all dissemination of material considered sensitive could increase, sources said.

This could cause problems for users attempting to find out complete and comprehensive specifications of both products and software systems, and could seriously cripple the publication of results from university research programs.

ACM's move came in response to a report developed by the council under the direction of its staffer, Dr. Gus Weiss, that, while classified secret, is alleged to recommend stiff new regulations concerning not only the export of equipment but also the export of knowledge in the computer field.

Sources with access to the report indicated that the regulations could well hinder publication and scientific exchanges in the area of computer science, while at the same time helping open the door to increased export of third-generation peripheral equipment, now under consideration in the Department of Commerce.

(Continued on Page 2)

Court Voids Hiring Freeze Order

N.H. Central DP Agency Back in Active Growth Mode

By Ronald A. Frank
Of the CW Staff

CONCORD, N.H. – A ruling by the New Hampshire Supreme Court against the governor has put the Centralized Data Processing (CDP) agency back into an active growth mode.

The activities of the CDP had been stalled because of a job freeze edict handed down by Governor Meldrim Thompson [CW, Feb. 20]. The executive order which instituted the job freeze prevented CDP from hiring additional data processing personnel funded by the legislature, and needed to implement DP projects for many state agencies.

The Supreme Court ruling, handed down several weeks ago, said Thompson's order was invalid because there was "no constitutional or statutory authority granted the governor" to institute the job freeze. The ruling further said the order contravenes the powers of the legislature granted by the Constitution, and the petition for declaratory judgment, requested by the legislators who brought the suit, was granted.

With the freeze lifted, CDP now has the go-ahead to hire 19 new staff members, according to Arthur Hill, director of the agency. In addition, CDP appointed Robert Strickland to the post of deputy director. Hill had wanted to name Strickland to the deputy's post but N. Edward Berg, chairman of the CDP Commission appointed by Thompson, had sought to block the appointment.

Because of the job freeze and the political impasse between CDP and the governor, DP projects for state agencies have been set back from seven to nine months, Hill estimated. But the legislature had made funds already approved for DP projects non-lapsing so the money can be carried over into next year, he added.

One of the projects to be implemented by CDP on its Honeywell 6060 mainframe is a system to track bills in the legislative process. The applications software to track the bills was written by the State of Maine DP staff for its Honeywell system and provided to the New Hampshire CDP staff as part of a cooperative effort among state HIS users.

Another project abandoned last year due to lack of staff did not fare so well. A special session of the legislature, which recently adjourned, failed to provide an additional appropriation for the state Criminal Justice Information System.

The first stage of this system, called Teleprocessing of Records and Communications for Enforcement (Trace), was implemented in 1973 but later halted due to lack of funds. Trace provided an online connection for local police departments to the state police record files and it also allowed local agencies a more direct link into the FBI's NCIC system in Washington.

The earliest that Trace can now be resurrected will be next January when the legislature reconvenes, Hill said. If additional money is appropriated, the system could again be in operation by July 1975, he estimated.

Senator, Governor Split on Consolidation Bills

(Continued from Page 1)

know beans about computers. The centralization of the operation would help the situation."

After the legislation was formally presented last month, the governor said he considered it "abhorrent" that the bills included the collection and centralization of confidential tax information.

"The governor," Kret maintained, "is totally wrong and has read just the opposite meaning into the bills. I'm just as concerned about confidentiality and privacy as anybody."

Kret added, "I'm sure it's the old story of the boogey man: 'Big Brother' is going to take over if the computer is used in this manner."

Kret pointed out that his legislation allows members of the various divisions of state government to sit down, discover their needs, discuss the inherent problems of broadening computer data collection and set up security guidelines for the system.

What Criteria

Kret added that he would provide the technical expertise since he is an electrical engineer and has his own computer consulting firm.

But herein lie the problems with the bills, according to an aide to the governor, William Macon. "The governor believes that Kret's legislation doesn't spell out by what criteria the control committee would set up the security guides.

"Look at the problems that could arise if a bunch of radicals got on the committee and started making their own rules," he explained. Macon also said the governor fears not only "political subdivisions" would work their way into the system. "What if private concerns get access?" he queried.

Kret reiterated that he wanted to make clear that "only government employees" would decide who has access to the information and that "political subdivisions" means local and county governments, not private enterprises.

Williams, nevertheless, recently expressed concern that "despite safeguards written into laws, we are observing today the divulgence of private secrets by governmental employees across the nation."

Kret admitted that because of the controversy and a similar past legislative attempt there is a good chance his legislation won't pass. Citing a past bill of his that proposed making a state network from computerized school data, Kret said "the liberals in the state congress were afraid of it as a strong, authoritarian idea and the ultraconservatives saw it as another 'Commie' plot. Needless to say, that bill was killed."

Political Problems Beset State

(Continued from Page 1)

portion of its work using 60 Univac Uniscope terminals to access a HIS 6000 data base in the administration department's consolidated DP center.

Revenue department officials were soon complaining about lack of cooperation, hardware problems, software incompatibility and generally about the way their work was handled, said Alfred Robinson, director of information services in the administration department.

Hardware was not really a problem, Robinson stated, although "we had some bugs in some tape drives," and these caused trouble during the critical implementation phase of the revenue department's file buildup as it moved to the HIS data base. But this problem has been fixed since January, Robinson said.

The revenue department didn't meet its time schedule for getting its automated system working and a backup of tax information began building up.

In December, Governor Edwin Edwards reportedly said the states central computer operation was in "a shambles."

Now the revenue department wants its own computer, and not a Honeywell unit at that, Robinson declared.

Plan Unconstitutional

(Continued from Page 1)

both Governor Francis Sargent and legislative leaders as a money-saving move, would have created one computer center to handle most state data processing needs, particularly those of the governor's office and the legislature.

The order could have a wide-ranging impact on other states since it is based primarily on the constitutional premise that governmental power should be split between executive, legislative and judicial branches.

Volunteers to Help Economic Policy Council

ACM Seeks Guides on Export of Knowledge

(Continued from Page 1)

Weiss would not comment last week, even going as far as to claim that there was no report but rather several "studies" of the question for the Council.

However, other sources claimed the report was filed two weeks ago and is now awaiting presidential action, having already been approved by an interagency committee made up of representatives from the State Department, National Bureau of Standards, Atomic Energy Commission, Central Intelligence Agency and the Department of Defense.

At the same time, Weiss pointed out that any regulation on control over export of technical knowledge would not come directly from the Council on International Economic Policy, but rather from the President himself or from the Commerce Department.

To date, however, the regulations seem to be developing in a vacuum, and a highly classified vacuum at that.

Another report, from a technical advisory committee to the Office of Export Control – a committee which includes industry representatives – has been delayed, so all the regulations presently in effect are without industry input, sources maintained.

This group was to report by April 1, sources said, adding that when the report is finally delivered it also could well be classified. The report is expected, however, to deal mainly with equipment export in the areas of CPUs, peripherals, components and test equipment, and only marginally to take up the issue of scientific information exchange.

On the Other Hand

And while all is confusion in determining basic new avenues of U.S. trade policy with Communist countries, the Office of Export Control last week was burdened with applications from computer makers who wish to increase their exports to those areas.

Rauer Meyer, who heads the office, has two senior personnel in the organization working full time to process export applications, but they are falling behind due to a "greatly" increased workload.

The ACM letter to the council, signed by President Anthony Ralston, said: "It is my understanding that the council has recommended and has received the President's approval for, among other things, continuing and sharpened controls on computer technology and know-how.

Safeguards

"In addition," the letter continued, "the recommendations are reported to include proposals for establishing safeguards or deterrents to diversion of technology from one purpose to another or from one nation to another."

The letter stated that "the technical expertise represented by our members may be an extraordinarily helpful resource in the establishment and promulgation of practical guidelines and/or procedures for carrying out U.S. policies on restricting the flow of computer technology and know-how."

Ralston also requested specific "information on the actions already taken or being planned with respect to controlling the flow of information about computers, their design and manufacture, and the software necessary for implementing economically important applications."

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Elwin Bagley, field engineer for Data General, loads test programs for dual Novas.

Final test for Decsystem 500 is made by Tom Pulsifer.

Byron E. Smith, field engineer, puts Lockheed System III through its paces.

CW Photos by Edward J. Bride

Fred Lovelady spruces up the Scope Series 200 printer prior to St. Louis opening.

Advent of SDLC Seen Traumatic For 'Unprepared' Users, Vendors

By Edward J. Bride
Of the CW Staff

SAN FRANCISCO – The advent of IBM's synchronous data link control (SDLC) may have a traumatic impact on users and manufacturers of data communications equipment, according to Saroj K. Kar, president of Telecom Computer Technology in nearby Sunnyvale.

The new line protocol has yet to make a debut in an IBM product, Kar said, but

Caravan/74

when it is incorporated in hardware, the makers of competitive terminal equipment will be chasing after IBM in designing interfaces, he suggested.

It could take as much as a year before users will be able to take advantage of cheaper independent equipment, he added.

It appears that those hardest hit will be the makers and users of equipment which interfaces to IBM hardware, other sources indicated.

One technical source said with interfaces built into software, adoption of SDLC will be less traumatic. Possibly, currently installed intelligent terminals could be field-modified for SDLC compatibility, but "dumb" CRTs may need to be replaced or undergo engineering changes, sources said.

Underexposure

Kar said he was surprised that many vendors have not familiarized themselves with the information currently available on SDLC, noting that the concept had been introduced two years ago.

Ignorance of SDLC will mean loss of markets for vendors and a reduction of available equipment for users who want to take advantage of the new line discipline, he contended.

Other sources recalled that until recently, communications suppliers had expressed confidence that the interface problem would never interfere with their technical or marketing plans.

"They never thought the problems of tape drive makers and disk drive makers would ever impact the communications users," one source commented, adding, "IBM is proving them wrong, too."

Communications suppliers in the past had contended that interfaces for this aspect of data processing were "standard" and that no new disciplines would affect the state of the art, he said.

'Stay Flexible'

Kar made his comments after attending a Computer Caravan session during which Richard A. Kuehn advised users to "stay flexible" by avoiding long-term leases on terminals, front-end processors and data transmission facilities.

Noting the recent AT&T rate filing for the Dataphone Digital Service [CW, March 27], Kuehn suggested his prediction of a carrier "rate war" was coming true.

If users avoid long-term agreements and write off purchased equipment as fast as possible, the financial impact data communications has on a company will be much more positive, Kuehn said.

Card Format Eases Key-Disk Switch

ST. LOUIS – Maintaining the 80-column card concept (card image format) when converting to key-to-disk can reduce the problems of conversion to a minimum, Computer Caravan attendees were told here.

Kathy Vieth, DP manager for Boatman's Bank, said the easiest way to convert is to keep the current operating environment and fit the new system into the shop around it.

Now after two years, she feels the bank is ready to evaluate what key-to-disk has to offer over and above the card image format.

The main problems in conversion, she said, are more of a public relations nature. "You have to sell the new concept," Vieth said, "and you have to use a different sales pitch for top management, the user and the DP staff."

In order to convert, she said, you must have a firm commitment from higher management to go from cards to the key-to-disk system. "You can't use a financial or staff reduction ploy to convince them," she said, "because you won't be able to realize those savings immediately."

"But," she said, "if you can show them that you can maintain your current work force and increase volume, thereby realizing savings a year or so down the road, that they'll understand."

To illustrate this point, Vieth said that since the installation of its Inforex equipment, the bank has had a 45% increase in DP personnel, but a 71% volume increase.

"I figure we would need four more people today if we hadn't gone to key-to-disk."

OCR Saves, Even With Retyping

ST. LOUIS – Even if original documents are converted into specially typed OCR forms before being read, OCR can still save money compared with keypunching, Delmar Smith told a Computer Caravan workshop.

Smith, who is principal consultant to McDonnell Douglas, noted that other savings can be realized by using a central typing pool as a means of converting data. The company currently has 105 OCR typewriters placed in the operating departments.

The company found savings when comparing keypunch with OCR entry in two of its installations, he said.

Smith said that by comparing the cost per hour operated for a large facility in Belleville, Ill., devoted to OCR typing with a keypunch facility in Columbus, Ohio, the company found a 7-1/2% savings for OCR typing.

In addition, he said, a very real cost savings is found because of increased production and a reduction in the required keystrokes. "We generally experience from 1,000 to 2,000 strokes per hour greater throughput by OCR typing," he said.

One user problem with OCR, he noted, is that data processing personnel are used to a positive yes/no condition, meaning the computer bits are turned on or off – there is a hole punched into the card or it is blank.

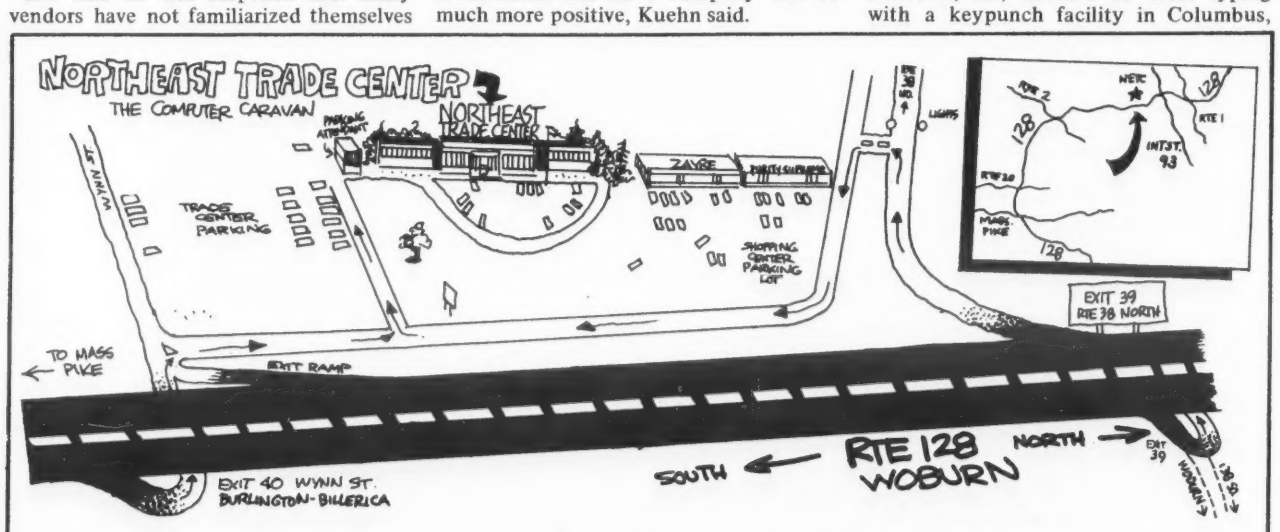
"But with OCR," he said, "you find a yes/no/maybe situation and it is something that must be controlled by the user with computer editing, validating and logic check."

Choose Wisely

Rounding out his workshop on optical scanning, Smith gave attendees some hints on how to choose a system. Points to consider include:

- The right paper handling device. Will you be reading documents, pages or journal tapes? Would a combination reader be better suited to your needs?
- Speed of paper handling device and speed of recognition logic. Will it handle the anticipated volume of data and allow room for growth?
- Quality of the recognition logic. Will it need to read characters of a poor print quality?
- Should the reading device be on-line to a central computer, or would an off-line device better fulfill your requirements?
- How is the device going to be justified? Cost? Faster service?

And of course, he said, you should always consider the level of vendor support.



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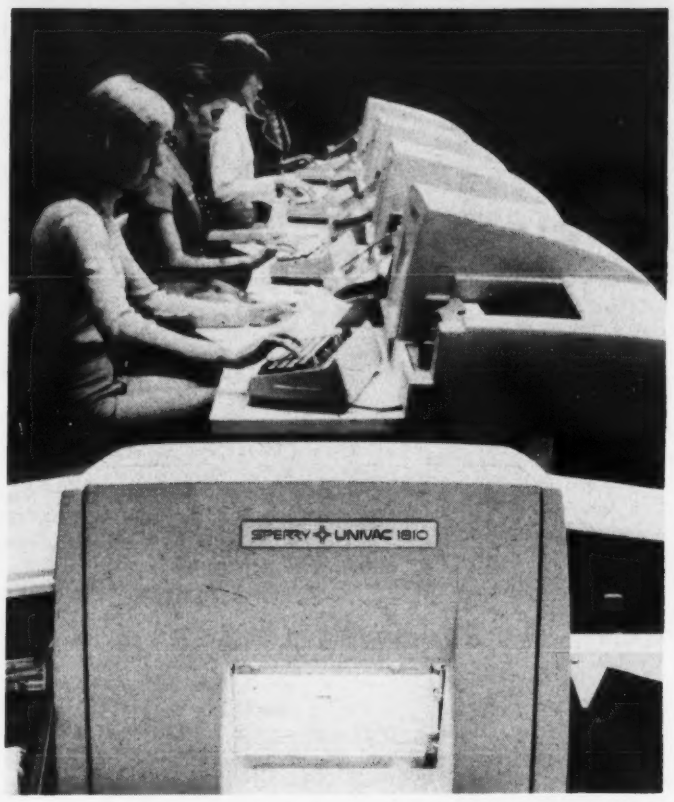

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DPMA OKs Standards for Privacy of Records

PARK RIDGE, Ill. – A standard of "ethical professional" conduct in the area of privacy of individual records in data bank systems has been adopted by the Executive Council of the Data Processing Management Association (DPMA).

The standards carry no penalties for violations – such as expulsion from the association – but are rather meant as a "position statement" to focus attention on the problem, according to Donn W. Sanford, DPMA executive director.

The standards are made up of four basic concepts.

First, DPMA members have a responsibility to continuously "strive to honor the rights to privacy of all individuals" by using information provided only in the manner for which it was intended or obtained.

Secondly, it is a professional responsibility to maintain the confidentiality of any data entrusted to the care of a DPMA member in his professional position, according to the standard.

Next, the standard stated that DPMA members should not use any confidential information entrusted to their care to further their own personal interests.

And finally, all DPMA members are required by the standard to attempt to remove any misleading or inaccurate data associated with any individual, immediately upon learning that its status is erroneous.

Sanford said the question of penalties for violations of the code was "a difficult" one and it would be extremely hard to attempt to expel members for violations.

However, he said, by spotlighting the code – and informing all incoming members of its provisions – the association hoped to foster professional conduct in the area of privacy and to make all members of the group aware of their duties and responsibilities to individuals.

In a recent talk on the same subject, Sanford warned that future legislation and regulations in this area must be "both practical and workable."

Safeguards should be developed, he told the National Bureau of Standards Conference on Privacy recently, "which will protect, without crippling, business and government.

"Hastily drafted procedures or laws passed in fear of the 'Big Brother' syndrome will surely be as onerous as the ill they seek to rectify," he said.

"We obviously see the need for stronger, more effective rules, laws and procedures, but hope that a balance will be maintained to assure that what many have called the greatest business development of all time – the computer – will not be reduced to piles of rubble, unable to help because it has been rendered powerless to harm," he added.

Vice-President Ford to Address NCC on Privacy

(Continued from Page 1)

systems and the second jumping on the energy bandwagon and the role computers may play in easing the crisis.

Even the major addresses scheduled for the convention will tend toward industry-oriented views with C.W. Spangle, executive vice-president of Honeywell; John D. deButts, chairman at AT&T; and Afips President George Glaser all presenting major speeches, with Glaser scheduled as keynoter.

At the same time, the reviving state of the computer industry economy is clearly shown by the increases in number of exhibitors and booths for the show, with 245 companies expected to show their wares in 807 booths in cavernous McCormick Place here compared with 215 companies exhibiting in 613 booths at last year's NCC in New York.

The 10 applications-oriented topics planned for the conference include:

- **Health Care and Biotechnology,** which will include eight sessions focusing on clinical data acquisition and analysis; patient monitoring, computer-aided medical diagnoses; hospital information systems; computing systems for pharmacology; and management acceptance of computer technology in the medical environment.
- **Computers in Education,** made up of 10 sessions, will cover the use of computers in school administration; science education; career guidance; continuing education; and programs for the physically handicapped along with five sessions on the education of computer professionals.
- **Computers in Manufacturing** will concentrate – in nine separate sessions – on numerically controlled tool applications; computer graphics; shop floor control systems; and manufacturing information systems.
- Two related topics – **Retailing** and **Distribution** – will be the subject of 11 sessions at the show with major emphasis on point-of-sale; standards for retailing; impact of POS on communications systems; store-ordering procedures; warehouse systems, and merchandising.
- **DP Applications for Government** units will be the subject of five NCC sessions, covering such topics as governmental information systems; law enforcement; transferability of government programs; and cooperative use of computer systems.
- Under the topic of **Computers in Finance** there will be five sessions covering such topics as Electronic Funds Transfer Systems; guidelines for EDP evaluation for banking; and terminal system applications in the financial community.
- **Computers in Industrial Process Control** will feature four sessions outlining hardware and software concerns for process control; applications of computers in R&D laboratories; and system simulation and interaction.
- **Communications Systems** will focus on networks, minicomputers, domestic satellites, switching and cable systems during six sessions.

Under the theme of computer sciences and technology the organizers of the convention have planned five general subject areas, including:

- **Software Systems** will have 12 sessions covering such topics as the Tenex operating system; trends in software products; real-time system development; artificial intelligence; security "kernels;" programming and programming languages; and program debugging.
- There are 11 sessions under the topic of **Computer Hardware and Architecture,** including overviews of associative processing; voice recognition; intelligent terminals; computer graphics; display processing; large-scale processors; microprogramming technology; mass memories; and advances in memory technology.
- Nine sessions will be presented dealing with **Information Management Systems,** highlighted by a report on the IBM security study; humanization of information systems; research in data security, and accessing data bases through minicomputers.
- **Computer Networking,** the subject for seven sessions, will survey hierarchical networks; local and distributed networks of minicomputers; interfacing of large computers to networks; and trends and developments in performance measurement for networks.
- **Management Acceptance** will form the major topic for 11 sessions at this year's show, outlining such topics as utility computing; structured systems development; management impact of networks; improving systems effectiveness; computer center management; charge-out systems; and certification of computer professionals.

CDC 200M-Byte Disk Tied to 360/370

(Continued from Page 1)

units uses microprogrammed diagnostics incorporating floppy disk technology. Both single-density (100M byte/spindle) and dual-density drives can be used on one controller.

A controller and two spindles lease for $2,968/mo with maintenance. Purchase price is $117,000 compared with $161,000 for a similar system from IBM.

Bell Sues MCI

CHICAGO — AT&T has countersued Microwave Communications, Inc. Charging that firm with an illegal attempt to monopolize the private-line communications market.

The action — a response to MCI's antitrust suit against AT&T — Charged that MCI and its subsidiaries abused the regulatory process by urging the Federal Communications Commission to adopt "anti-competitive restriction against existing common carriers" and accuses MCI of submitting "sham tariffs and pleadings."

Furthermore, MCI was charged with monopolizing the private line market between Chicago and St. Louis.

MCI, noting that it had total revenues of only $200,000 last year compared with Bell's $1 billion in revenues from long lines alone, said it had only .02% of the private-line market and that "the only explanation we have for AT&T's claim is its date, April Fool's Day."

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If you're an advertiser, you should also note that we'll be distributing extra copies of *Computerworld* right at the show. So you'll get more readership than ever. Issue and closing dates are below. For more information, just contact your *Computerworld* representative. Or call or write Judy Milford at *Computerworld*, 797 Washington Street, Newton, Mass. 02160 (617) 965-5800.

	Issue Date	*Color Close*	*B & W Close*
NCC Preview Issue	**May 1**	**April 12**	**April 19**
NCC Show Issue	**May 8**	**April 19**	**April 26**
NCC Wrap-Up Issue	**May 15**	**April 26**	**May 3**

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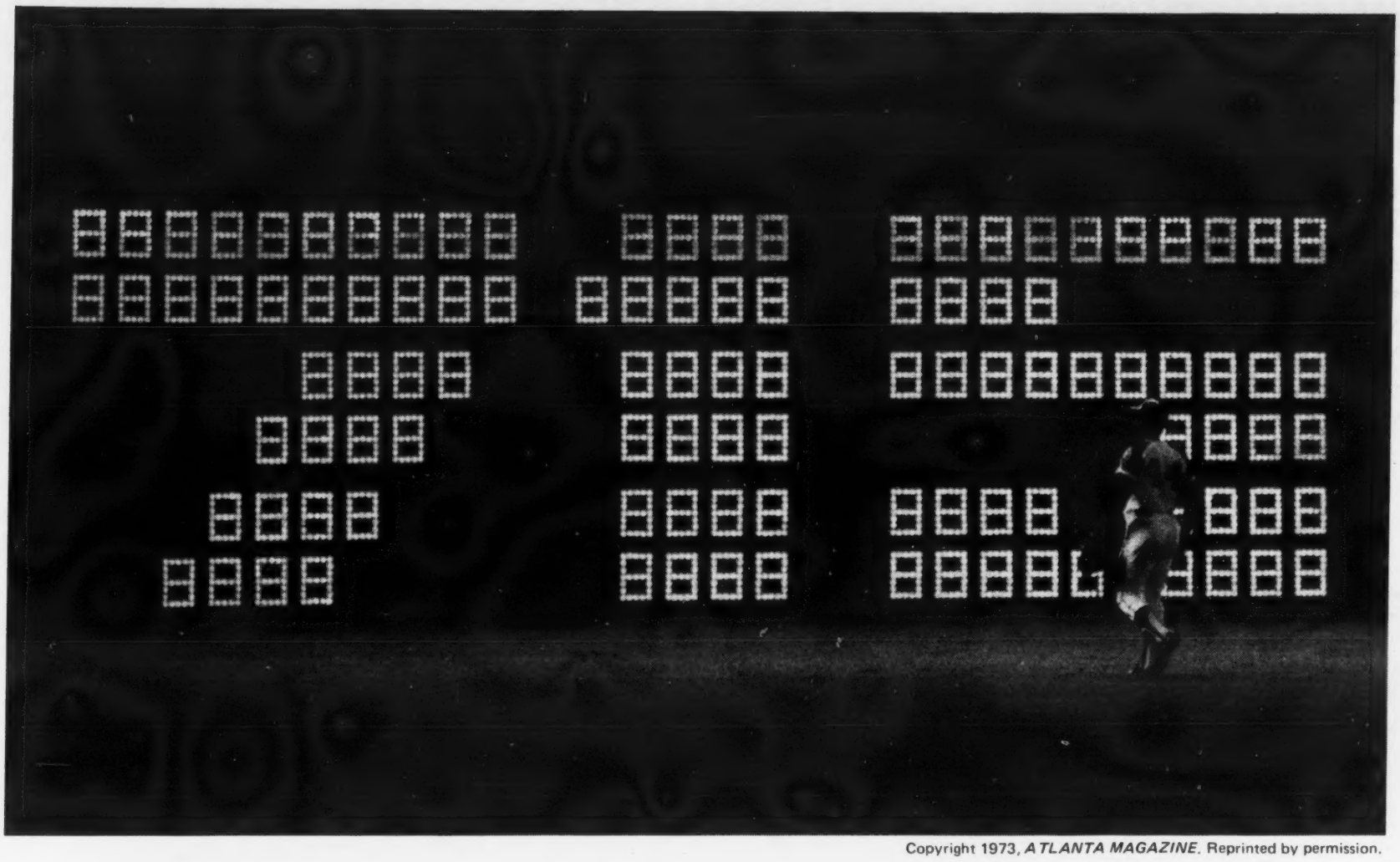

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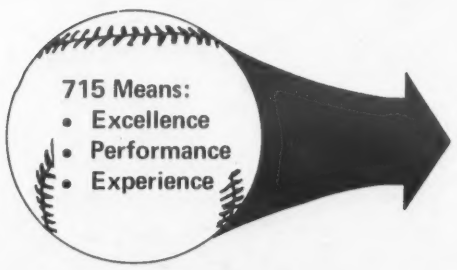

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Hardware Cuts Prevalent

Fewer Funds Send University Centers Scrambling

By Molly Upton
Of the CW Staff

NEWTON, Mass. – University DP centers, faced with dwindling research funds and educational allowances on IBM equipment, as well as rising operating costs, are doing some soul searching on ways to improve operations while living within their budgets.

Although most managers contacted in a *Computerworld* survey expect their budgets to rise "slightly" in the next fiscal year, some noted funds will still be below those of 1970-71.

Reach for the Sky!

"One thing is certain: bottom line expenses are up," noted Bruce Gilchrist, director of computing activities at Columbia University. Cost of supplies and air conditioning is up substantially, and salaries are climbing, he said.

Price hikes by several manufacturers, including IBM, don't help matters, he added.

It is a "much tougher struggle" getting a budget approved than it was before 1970-71, observed Jeffrey Akner, director of computer services at New York University.

"We really have to justify what we're doing," he said.

"Before 1970-71 we were just growing and growing by leaps and bounds with no constraints whatsoever. They were just about okaying anything we put before them. Now it's completely different," Akner said.

DP center managers are upgrading with independent peripherals and encouraging conservation and recycling of paper and cards.

At the University of California, Berkeley, the cut in R&D funds since 1968 has caused the DP center to reduce its hardware from two owned CDC 6400s to one, and to return a leased 360/40 to IBM.

The cut in grants has meant less time sold to faculty members, thus reducing the total budget for the center, noted center manager Ken Hebert.

Although motivated by an effort to save money, the university has discovered the students prefer to operate the six card readers and printers scattered around campus rather than hand the jobs over the counter, according to Hebert.

Although the University of Pittsburgh's DP center budget is slightly higher than last year's, it is still below that of 1970-71, observed Raff Ellis, director of DP.

Since then, two 360/50s and one 7090 have been replaced by two dual-processor Decsystem-10s located in an off-campus center, and capacity has been increased by about 400%, he said.

During the transition the university went from leased IBM equipment to equipment purchased from DEC, and Ellis estimated this move reduced equipment charges by about 30%, from $800,000 a year to $500,000 a year.

Stretching the Dollar

As an example of how universities are scrutinizing the dollar for ways to stretch it further, Ellis noted that part of a five-year plan drawn up about three years ago called for $3.2 million to be funded to the DP center in 1973-74. The actual outlay was around $1.7 million, he said.

The university was persuaded it could afford to buy the DEC machines when Ellis outlined a five-year amortization loan at 8% instead of paying IBM rentals and equipment charges.

The DP center staff performs maintenance on terminals and RJE equipment to cut down expenses.

"It's no panacea getting into maintenance, but given the way the university wants to operate and the level of sophistication it's willing to pay for, it's something you have to think about seriously," Ellis said.

New York University replaced a 360/40 and 360/50 with a 370/145, which carries a 10% discount. But the 50 had a 35% educational allowance, and the 40 had either 35% or 40%, Akner said.

"That's what's really tough living with, that IBM no longer maintains the policy they had. This is probably one good reason why we don't have a much bigger IBM machine," he added. The center also has a purchased Univac 1108, and the Atomic Energy Commission has a CDC 6600 on campus.

At MIT, some departments are picking up certain DP expenses on their own budgets, which helps alleviate costs to the DP center, observed Charles Libby, manager of administration and planning.

For example, next year the department of electrical engineering, which has been the principal user of APL, will pay for the support of APL. It also maintains an RJE station at its own expense, he said. Other departments provide their own terminals.

MIT's user departments are becoming increasingly concerned with cost overruns and tell the DP department what sort of warnings they wish to receive on the status of their accounts, Libby commented.

"The departments are looking

(Continued on Page 9)

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Smuggler Nabbing Plan Expands

WASHINGTON, D.C. – Life is getting tougher for smugglers thanks to a nationwide system of telecommunication terminals located in law enforcement facilities of the Department of the Treasury.

The Treasury Enforcement Communication System (Tecs) serves the U.S. Customs Service, Bureau of Alcohol, Tobacco and Firearms, IRS Intelligence Division, IRS Inspection Service and Interpol Washington.

Originally designed to thwart narcotics smuggling from Mexico, the system has been expanded from 20 terminals at San Ysidro, Calif., to more than 400 terminals at land border crossings along the Canadian and Mexican borders, key ports of entry, seaports and international airports.

The system, which works off duplexed Burroughs 5500s, provides the Treasury law enforcement agencies with a computer-based index and on-line access to the National Crime Information Center (NCIC) data base. In addition, the system provides immediate message-switching capability point-to-point and broadcast among headquarters and Treasury enforcement field levels.

University Centers Forced to Scramble

(Continued from Page 8)

for help in keeping the lid on" DP expenses, he explained.

A monitor system on the leased 370/165 notifies students and departments on the status of their accounts with the DP department.

Research still plays an active role in funding MIT's DP center costs. About 72% comes from research, he said.

However, Libby wonders whether more research will disappear, which could leave excess capacity on the Honeywell 6180 with Multics.

Several centers have found they were able to upgrade their peripheral gear at little extra cost, or obtain increased capacity at bargain prices.

MIT switched from IBM to Cambridge Memories for 3M bytes of core, but it is also phasing out Memorex disk drives in favor of IBM 3330s.

Columbia is replacing its 2314s with STC 3330-type drives, which "will give us a lot more capacity without much increase in cost," according to Gilchrist.

"We'll at least double our on-line storage capacity," he noted. The university has also purchased an Ampex core unit.

Its CPUs, a 360/75 and a 360/91, are purchased, "so that has solidified costs from that point of view." There was a substantial educational discount on those machines, he noted.

MIT is considering purchasing a 168 to replace its 165. Purchase, Libby noted, would cut next year's cost as maintenance is free for one year.

Columbia is selling its dozen purchased 2402 tape drives and controllers and replacing these with leased STC drives, which are self-loading, and will be higher-speed units.

Techniques for cutting down on paper costs range from the Berkeley method of charging for a deck of cards to using fewer header sheets and encouraging recycling.

Since Berkeley "started charging for cards, our card bill has been cut in half," center manager Hebert noted.

Columbia is trying to reduce paper consumption with the "least inconvenience to the user," Gilchrist claimed.

This includes reducing the number of header pages, encouraging people to use microfiche where possible and to think twice before they make multiple copies, he added.

NYU is looking at the Potter Grand Slam printer, which uses smaller type and paper.

The center links together logs and also asks people with large dumps to resubmit their paper so the back of it can be used.

The center is publicizing the crunch on supplies in the university newspaper, and students are encouraged to recycle paper and cards.

Akner said NYU is looking into Carnegie Mellon University's modification of a 1403 so the paper comes out at the top rather than the back, saving about six or seven pages per run.

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Salty Computer Handicaps Races

SAN DIEGO – A computer has gone to sea here to help officials of the San Diego Yacht Club handicap the standings in the San Diego-to-Acapulco ocean yacht race.

The system – a Hewlett-Packard 9810A – permits race officials to handicap the standings from the yacht's daily position reports 10 times faster than previous handicapping schemes, according to race sponsors.

Installed aboard an escort vessel, the system contains a data base of information on each boat's handicap in seconds per mile, which is developed according to international measurement systems.

When the daily position reports are radioed in by each boat in the race, the latitude and longitude are entered into the system along with the distance remaining to Acapulco and the distance from San Diego.

The boat's average speed is calculated from this information and the handicap is applied against this speed to give the boats' corrected speed. The boat with the highest corrected speed is leading the race under the handicap system that governs all ocean races.

CE Brings His Vacuum Cleaner When He Maintains This System

By Toni Wiseman
Of the CW Staff

SAN FRANCISCO – Dust, heat and humidity are not the best environment for a computer. But Woodrow Wilson High School's CPU has a 97% to 98% uptime in spite of temperatures which have been known to reach 90 degrees, noted Gene Muscat, director of instructional applications, EDP Resource Center, San Francisco Unified School District.

"The computer is in a classroom," he said. "There's no air conditioning, no false floors, the windows are open and you can all but see the dust rise every time the students troop in through the door," he said.

Their customer engineer, he said, has a big notation at the top of his book that says "Bring Vacuum Cleaner." "A vacuuming is a normal part of a preventive maintenance call, Muscat quipped, "but they don't usually have to empty the bag twice."

Despite the environment, he said, the computer stays up thanks to preventive maintenance. The filtering screens have only half the life span of those in industrial installations and they have to clean the tape heads every time they read a tape, "but that CPU stays up," he said.

The school's Hewlett-Packard 2000C has a 32-terminal capacity, but, he said, "we have 45 terminals out in the schools. We use a hunt and dial-up system – and it works."

The terminals are KSR 33s. Sixteen are in-house, hardwired to the CPU and the others are in remote locations, the largest user being the City College of San Francisco which has 16 of the terminals.

Muscat joked that when HP wants to prove to a customer that the computer can work under adverse conditions, it brings him to his school.

"We did have a 2116 processor at first that didn't like the environment," he stated, "but finally HP gave us a 2100 and it's doing just fine.

"We did have a minor problem once," he mentioned. "It got so hot in the room that the thermal relay threw. In fact, the system shut itself off twice."

Installation costs? There really weren't any, Muscat said. "We just plugged the computer in – literally."

Muscat believes a lot of the maintenance, such as head adjustments, could be done in-house by the students. The students already run the system, he said. There are no professionals on the staff.

"The students do all the programming, run all the jobs," he said. "I even have one student who is going to build me a modem this summer."

In the meantime, the network depends on Prentice, Anderson-Jacobson and Data Terminal Corp. to provide its couplers.

"We give new users a built-in coupler – simplicity first – and then when they get proficient, we give them a KSR with a separate coupler device," he said.

20,000 Riders Use Boeing's Car Pool

SEATTLE – A massive computer effort is credited for helping Boeing Co. establish "the nation's largest car pool."

The firm said it had encouraged its employees to car pool for years, but up until last summer only 500 workers were regular participants in the firm's "Share the Ride" program.

By November, as the gas crunch worsened, the number reached 3,500 and now it is up to 20,000 riders – making it the largest car pool system in the nation, according to the firm.

The 20,000 now in the program were matched by computer after some 29,000 Boeing employees filled out questionnaires on their work hours and addresses.

Canada Trying to Plug Gaps In Privacy, Data Bank Laws

OTTAWA, Ont. – The Canadian Government plans to introduce legislation in the near future giving citizens the right to inspect all records held about them in computerized data banks.

Gerard Pelletier, communications minister, recently told the House of Commons that there were 21 task groups working in his department trying to find ways to plug gaps in the privacy laws of the country, but he could not predict a specific date for the filing of new legislation.

In addition, Prime Minister Pierre Trudeau said the government was trying to work out some regulations that would protect the privacy of Canadian citizens even in the case of information that was held about them in data banks in the U.S.

Shipping Firm 'Clics' With Tracking Plan

By Alexander Dumas
Of the CW Staff

NEW YORK – Things are really "Clic"-ing now for the United States Lines, a local overseas shipping firm. The reason, according to company President Edward Heine, is the addition of an on-line, real-time inquiry system that cuts data response time at the company's domestic ports and terminals to the DP center here from three to six minutes to three to six seconds.

The system, called Clics (Computer-Linked Information for Container Shipping), costs $1.7 million annually to operate and Heine believes it's "the most advanced system now in the industry."

Using twin IBM 370/135s, which are identically configured so if the primary one fails the other will go on-line immediately, the company can trace any one of its more than 30,000 containers. The system, Heine pointed out, eliminates the possibility of lost cargo and "greatly improves" security because the exact location and status of any container can be determined instantly.

For the shipper, the system simplifies paperwork and allows quicker release of cargo, he continued. Seconds after a valid bill of lading is received, the system prints out an invoice which the shipper can use to immediately collect money from the consignee's bank. "Previously," Heine said, "this might have taken 24 hours or more.

Integral parts of the network are video display devices and IBM 3270-type terminals located in United States Lines' facilities at Long Beach, Oakland, Chicago, Savannah, Norfolk, Baltimore and Philadelphia.

Each computer has eight disk drives with a total of 232M-bit storage. By June, the storage figure will be elevated to 600M, Heine concluded.

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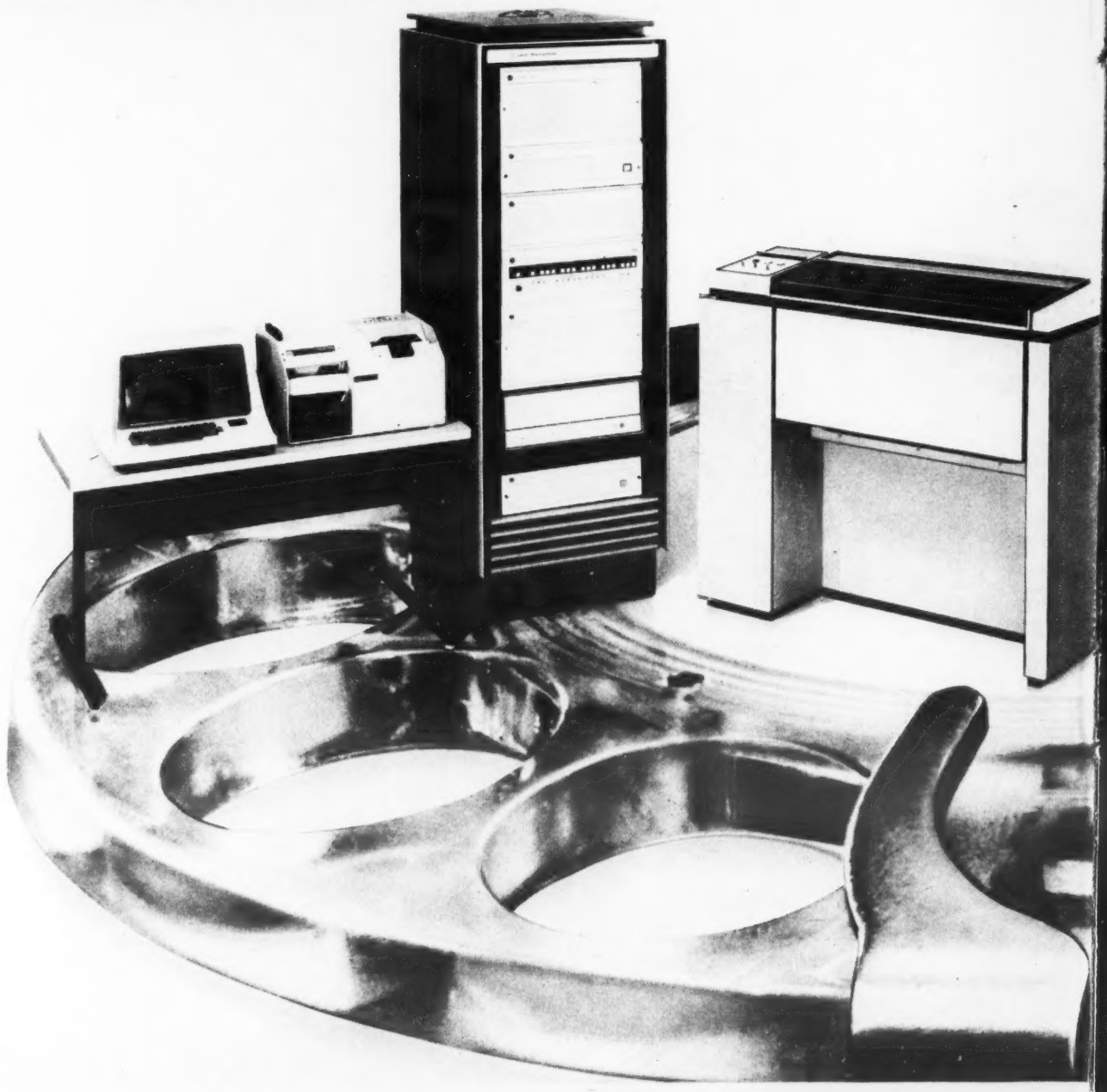

Computer Objectivity Praised

Psychological Test Evaluation by DP Making Strides

By Edie Holmes
Of the CW Staff

LEXINGTON, Ky. – Because computers have no emotions, a psychologist-psychiatrist here believes they might be better attuned than people to evaluating psychological test results.

Computers can be especially valuable in a criminal case where the public desires some measure of vengeance, as in the assassination of a prominent figure, said Dr. Joseph C. Finney, a professor at the University of Kentucky. To illustrate his point, Finney fed a computer the results of mental examinations given Sirhan Sirhan, convicted assassin of Robert F. Kennedy.

The computer diagnosis showed that Sirhan "was driven by the idea that it was up to him to do some dramatic act to right the wrongs of the world," Finney commented. The analysis found "a high enough degree of psychosis or schizophrenia for him to be mentally ill."

In trials such as Sirhan's, Finney wrote in *The American Journal of Psychiatry*, "It is difficult for the expert witness to be sure of his objectivity." If Sirhan's victim had not been someone as prominent as Kennedy, "I think the jury would have recommended diminished responsibility or would have recognized Sirhan's mental illness," he said.

More Material Received

Not only does the computer generate an unbiased opinion, but it can make a far more complex evaluation than humans usually do because it reviews more material. The average mental exam includes about 13 scales of psychological evaluation, while the program developed by Finney scores more than 150. Evaluation is based on such questions as the subject's tendency toward alcoholism on one scale, toward drug addiction on another and so on, he explained.

Finney attributes the success of his system to his program's flexibility in evaluating either the Minnesota Multiphasic Personality Inventory (MMPI) or the California Psychological Inventory (CPI).

Developed through a series of research studies begun in 1956, the program was first run on a computer in 1965. A federal grant to the University of Kentucky made computer operation routine by 1968.

Since 1971, the university has worked privately on the project in conjunction with Behavior Dyne Corp. A group of psychiatrists based in Palo Alto, Calif., Behavior Dyne currently holds a franchise from the university to operate Finney's program.

In addition to providing evaluations in criminal cases such as Sirhan's, the program, run on an IBM 360/65, has been used by psychiatrists and various counseling professions to interpret tests of thousands of patients and clients.

Getting to Know You

"Computer reports have been equated with approximately three to four hours of therapy time in helping a psychologist know his patient better," commented Dr. Gress LeMaistre, vice-president of Behavior Dyne Corp.

"We also serve industry," LeMaistre continued. "For example, General Motors has contracted with us to evaluate the psychological tests given the company's job applicants." He stressed that such evaluations are to be used only as an indication of an applicant's general health.

Like many industrial companies, GM has contracted for the service offered by Behavior Dyne Corp. in order to fulfill Occupational, Safety and Health Act requirements, according to LeMaistre.

Seven basic reports with 18 different options are generated by the computer. "We do put out a report to be ready by the individual tested when this is requested by a psychiatrist or social worker; however, this report does go to the professional person first," LeMaistre said. Both the language of and the detail in a report vary depending on who receives the evaluation.

Completely Confidential

"We don't use the name of any person being evaluated," he added. "All reports are completely confidential, except on court order, and we require the license number of every practitioner before sending out the evaluation requested.

Plans to add to the program are currently under way; Finney and his research team are developing a family counseling program.

Finney said computer diagnosis agrees with humans about 85% of the time. "No system is infallible, but maybe a computer and a person together might do a better job than we're doing now," he added.

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Front-End Processor Said to Work Best With Monitor Inside

CW West Coast Bureau

SAN FRANCISCO – To insure effective operation of a front-end processor, it is best to have a programmable monitor built into the front end instead of attaching a hardware monitor on the mainframe, according to David F. Stevens of the University of California Lawrence Radiation Laboratory.

The monitor could be used to analyze whether data communications problems originate in the line or the controller.

Stevens, computer center manager of the Berkeley-based laboratory, said the monitor should provide fairly good access to the inside of the system and the only way to get that is to have it built into the system.

People Interface

The relationship with the local maintenance engineer, Stevens said, is more important than the kind of terminal used.

"You need a good relationship with him or the people on the other end of the line will suffer," he told a recent Computer Caravan session.

At the laboratory, there is a CDC 7600 with additional CDC 6600 and CDC 6400 CPUs serving as front-end processors.

A total of five front-end processors are at the installation including an IMP to attach to Arpa, a Harris Cope system and three home-built units based on PDP-8s.

Editorial

The Mini's Might

A Florida software house is getting close to making Cobol available on a Data General Nova. An Australian outfit is offering Cobol for the DEC PDP-11. Finally, the language that has become the *de facto* standard for business DP is taking hold in the world of minis.

Cobol on a mini? Could be a real "bombshell," according to one industry observer. That may be overstating things a bit, but certainly it sounds good – potentially – to us.

Now there's at least a possibility of transferring to the small systems, application packages originally written in Cobol so they could be used on various mainframes. A mini user wouldn't have to reinvent so many wheels for himself.

And the pool of Cobol-trained programmers can be tapped to apply their expertise directly to work on projects on the small systems. The mini user wouldn't have to phrase his unique application needs in Fortran or Basic.

In sum, if a mini has the inherent power to do a DP job for a user, the user should have an easier time making use of that power.

'I'm Certain—Five Minutes Ago the Shelf Price Was 39 Cents!'

Letters to the Editor

'Who Invented Computer?' Absurd Question

Journalist Georgia Mollenhoff's incredible story that her fellow Iowan, Dr. John V. Atanasoff, is the "true inventor" of the computer should not be allowed to pass without comment, if only because a large segment of our DP community wasn't around in the late 1940s when John Mauchly and J. Presper Eckert and their coworkers introduced Eniac and Edvac.

Mollenhoff's story, which *Computerworld* reprinted as a three-part series, said that Mauchly stole the invention from Atanasoff in 1941, and instead of providing corroboration offers color – a vignette of Atanasoff's cry of "eureka" in the hilltop tavern as the computer springs from his brain like Athena fully armored from the forehead of Zeus; a rehash of the tragic death of Atanasoff's assistant with a dark suggestion of murder most foul; and an oversimplified characterization of the Sperry vs. Honeywell patent case where a federal judge held the Eniac patent invalid and unenforceable for a variety of reasons.

The following items of information deserve equal space:

ITEM: Atanasoff was present at the Eniac dedication in 1946 and was consulted by Mauchly and Eckert in connection with delay line concepts embodied in Edvac. Yet, it wasn't until two decades later when Atanasoff was a Honeywell witness that he finally claimed paternity.

ITEM: In 1945-1946, Atanasoff headed a Naval Ordnance team charged with developing and building an electronic digital computer. BuOrd Project Order A0205 made $300,000 available (about the same amount used in developing Eniac). After a year and a half of nonachievement, the Navy terminated the project. Nothing came of the 1941 invention.

ITEM: The 1941 Iowa computer model had rotating commutator switching, i.e., electromechanical, rather than electronic devices. One of the key contributions of Eniac – dinosaur that it was, even at birth – was its demonstration that the 1,000 times speed advantage of electronic switching over electromechanical switching could be achieved and practicably utilized in DP, consistent with reliability.

ITEM: Sperry took over the Mauchly-Eckert Eniac patent application, shaped it to fit its commercial purpose of dominating the new industry (how ludicrous it seems today) and Judge Larson said, in effect, "OK, if you claim that you invented *the* automatic electronic digital computer, I accept your broad definition and find that Atanasoff's work fits the same subject category and that one-on-one coincidence invalidates" (after having already invalidated the patent for other reasons). Faced with an antitrust treble damage claim, Sperry settled with Honeywell and there was no appeal of Larson's decision.

"Who invented the computer?" is an absurd question. In matching the question with an absurd answer, Mollenhof has done a disservice to history, the reputations of good people and the standards of her profession.

Jerry Cohen
Newton, Mass.

Oh, come on, Jerry – it isn't nearly that bad! There are other Atanasoffs: Schutz, who built a usable version of Babbage's Difference Engine; Konrad Zuse, whose models were destroyed in WWII; and at the electronic level, one Halsey Dickinson of IBM Endicott, who had patents on vacuum tube computing circuits in the Thirties, and whose designs, embodied in the SSEC, were doing major scientific calculations before the Eniac was moved from Philadelphia to Aberdeen.

What the judge said was that Mauchly and Eckert could not patent their Eniac work for several reasons, one of which was that Atanasoff had preempted certain areas. The Dickinson circuits, some of the IBM/Aiken patents, the Eccles-Jordan concepts, all preempted adjacent areas.

The real father of the computer is Charles Babbage, not Hollerith, not Aiken, not the Eniac boys, not Stibitz or Zuse or Johnny von Neumann. Atanasoff was clearly *earlier* than Mauchly, but clearly not as important. Others, at the component level, were earlier than Atanasoff.

I thought Mollenhoff's stories were excellent, including the human touches. Mauchly and Eckert are old friends of mine. Their position, and that of clumsy old Eniac, is secure. But credit for others is also vital. HG

Some Words of Praise From a Lockheed User

The March 27 article on small systems users certainly did commend the IBM System/3 when you quoted so many people having them on order and replacing other systems.

On Jan. 12 we replaced an IBM S/3/10 with disk and now use the Lockheed System III manufactured by Lockheed Electronics Corp. We've had one service call since then and were down for about half an hour. The Lockheed System III is every bit as good as the S/3, and perhaps better.

The disk operating system is much easier to use and the basic machine comes with a video/display keyboard for input/output and control. In addition to its being as good or better than the S/3, it also costs 40% less. The RPG II programming is every bit as good as the IBM RPG II. The utilities are better.

Our background:

We started using a computer in January 1970, an IBM 360/20. In May 1970 we had the first S/3 installed in the State of Nebraska, as a card system. It was upgraded to disk in March 1971. We do servicing work for 26 other credit bureaus in six states, mainly in the area of collection department accounting and repetitive clerical tasks.

I was tired of receiving letters from IBM raising the prices on the average of every three or four months, and also, the complete inflexibility of IBM regarding the smaller system user. Therefore, last October I began searching for another system to replace the S/3. It wasn't easy and I lost a bundle of money trying to install a Focus IV machine, which as you know went bankrupt. However, I learned about Lockheed System III in August 1973 and our machine was installed Jan. 12.

The Lockheed System III is fairly new. There are less than 250 systems in use throughout the country, but that's temporary. It really is a good piece of hardware.

Ken Opp
Manager
Computer Division
Credit Bureau
Lincoln, Neb.

Unlucky Thirteen

Re the Page 1 article on small system users [CW, March 27]:

At no time did we ever have 13 B1700s installed as terminals. One was used as a replacement for a batch-processing IBM 360/20, and one as a developmental machine for an intelligent terminal.

In the early summer of 1973, it was determined that the Data-Comm hardware and software were not sufficiently developed to meet our needs and the project was discontinued. The second B1700 was retained for batch-processing purposes.

David H. Krapp
Operations Analyst
American Hospital Supply Corp.
Evanston, Ill.

Common Sense Needed Before Emigrating

Re "Think twice before going down," in the March 27 Letters to the Editor section:

The lack of common sense displayed by the unidentified author of that letter is incredible. Placement services where the job hunter pays a fee exist in this country. Other countries have different practices.

Many U.S. citizens have a tendency to feel that U.S. law, practices and customs apply in other countries. This is simply not the case. Anyone who would plan to emigrate without first checking that country's entry requirements deserves to be turned back at Customs. A person who assumes he is welcome in another country because his talents are in demand in his own country probably is not psychologically and/or emotionally equipped to handle the culture shock and should stay put.

Australian consulates in major U.S. cities are happy to provide all sorts of information on emigration policy, working conditions, etc., concerning Australia. The placement service in question is not the only placement service available. The Australian Government has an employment service similar to state employment agencies in the U.S. A little research would probably turn up more.

I do not represent the agency in question or any other agency. I am considering emigration to Australia and have contacted the agency in question, along with the Australian Consulate-General, its government employment service and several other sources.

In my military experience I have seen numerous "ugly Americans" caused by their own lack of common sense, inability to realize that other countries have different business and social practices and an inability to accept and cope with culture shock.

James R. Shannahan
Captain, USAF
New Baden, Ill.

Vadic's the One

International Reservations approached Vadic Corp. to build a custom modem and dialer unit, not Beta Corp., as reported in the March 6 issue (Page 4).

Daniel E. Milton
Vice-President
International Reservations
McLean, Va.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Automobile Ombudsmen Possible?

We Need Protection From Driver Information System

Viewpoint
by Herb Grosch

There is a mysterious world of state motor vehicle offices, Soundex coding, data bank pointers, traffic courts, automobile and truck numbering systems, recall orders, NCIC (National Crime Information Center) terminals that interests and affects all of us. We all drive, most of us own cars, most of us have had accidents and traffic tickets, some of us have had cars stolen. Many of us move from state to state, changing driving licenses and car plates as we go.

The recent concern for privacy in all kinds of official and private data systems has begun to open up that world to the bemused gaze of DP people and civil liberties advocates. And along with past and present computerization, along with future plans for on-line improvement and interfacing with other installations and networks, has come the urge to re-examine the social underpinnings of car and driver information systems.

The HEW report, "Records, Computers and the Rights of Citizens," contains in Appendix D a conspectus of the National Driver Register, a subterranean function of the U.S. Department of Transportation which enables state motor vehicle administrations to check driver license applications against suspensions and revocations in other states.

Changes are proposed in that system; it is proposed that prospective employers (of taxi or truck drivers, in theory, but probably of much broader categories, in practice) have access to the register. It is proposed that medical and physical limitation pointers be added. It is proposed that pointers to conviction records which did not result in a suspension or revocation be added. And of course, it is proposed to provide sophisticated on-line response capability instead of the present 24-hours-plus-mail-time; consultants always want follow-on contracts!

Vehicle identification numbers (VIN) are required on state registration forms, and are also vital (since they include a serial number) for manufacturer recalls when safety defects are to be corrected. The National Highway Safety Administration has required manufacturers to list the VINs of cars which are not brought in for correction; now these lists are to be provided to insurance companies. Will the latter attempt to avoid payment of damages to owners whose cars are listed? If not, why do the companies want the lists? Or do they: perhaps the bureaucrats are just being righteous?

Bum dope in all such systems is supposed to be corrected, old stuff is supposed to be purged. Is it? We cannot know, because unless the HEW report recommendations are implemented – implemented in every state DMV as well as at the register – no outside probe of the data is permitted. A driver license applicant cannot contact the register directly; inquiry can be made on his behalf by the state agency concerned, but what if they don't want to bother, or are too busy?

Power to Punish

And there is a great temptation to use the interconnect capabilities of machine systems, batch as well as on-line, to enforce and to punish. Years ago I got a jaywalking ticket in downtown Los Angeles, a municipal offense, and of the very lowest level of seriousness: a "violation," not a misdemeanor or a felony. My car was blocks away. Asked to show "some kind of identification," I produced a New York credit card.

A year later I was coolly notified by the State of California that my driver's license would not be renewed until I settled my jaywalking summons. Obviously the Sacramento DMV had been asked by a municipal court clerk to check whether I had a California license, and a computer-originated form letter was dispatched. The licensing power of the state motor vehicle office was being used to cheaply dragoon a person accused of a completely nonvehicular offense.

Now, extrapolate that to a future in which any employer (and that can be anyone who prints up a letterhead), any insurance company, any court or probation officer, any policeman can query data held in the National Driver Register, follow pointers to further data in any state and many local driver-license and vehicle-license data bank, and use that data to harrass and intimidate, to withhold or withdraw job offers, to refuse or revoke insurance coverage, to require expensive repairs.

Some of those queries would be illegal in all states now, and all of them would be illegal in some states. They certainly occur, as routine procedure, as personal favors, or corruptly, up and down the U.S. – have occurred in the past, will occur much more easily and frequently in the future.

If we believe the protestations of the FBI and the NCIC people (and I don't), if we believe the protestations of the register people (well, maybe), *innocent* citizens are hardly ever injured by such files, computers and networks.

They would be glad to correct individual injustices, they say, meanwhile struggling fairly openly against letting individuals get anywhere near their central operations. "Go to your friendly local DMV office, your friendly local police station," they say. For a well-off white male with gray crew cut hair to do this in Santa Barbara is certainly possible; for a poor young black with a bush Afro to get help in downtown Philadelphia is something else again.

I believe we need an extension of the ombudsman concept in this area. Putting aside the various automobile associations as hopelessly perverted, discounting newspaper and radio station hot lines as sparse and poorly motivated, and remembering ACM's financial problems, it looks like the Civil Liberties Union sort of job. Since they have so much really heavy stuff on their plate right now, I wonder if a new outfit, a Drivers and Car Owners Protective Association, might not be viable? With terminals connected to all the adversary data banks, I hope? We're going to need it.

1974 Technical Revolution

Judge and 'Computer-Tamer' Spark New File Designs

The Taylor Report
By
Alan Taylor, CDP

I don't know what a computer tamer looks like, but Bill Pringle didn't really look like one. He didn't have a whip or a JCL card, and there wasn't a computer in sight, yet he looked at home sitting in the Palm Court at New York's Plaza Hotel. Which is not surprising, because Pringle is employed at the Plaza, knows what he wants from computers and will wait until he can get it safely before bringing in computerized services. An important man from the computer trade's point of view – but not a bits-and-microseconds expert.

Another nonexpert in computers is Chief Justice Walter H. McLaughlin of the Massachusetts Superior Court. Although the two have never met, McLaughlin and Pringle have a number of things in common. They are both aware of the need for deliberation as well as speed in the introduction of new information-processing systems, they are both aware of the potential of properly handled computers to help improve matters for everyone, and they both happen to have set April 1, 1974, deadlines for the accomplishing of particular, somewhat related information management goals.

Pringle's problem has been handling the direct billing for hotel customers well enough to improve collections without alienating people, while McLaughlin's area of interest is the scheduling of court cases through the Superior court system, without coming up with schedules that call for a single district attorney to be in 11 courtrooms simultaneously!

The similarities between the hotel and court problems and the way they are being handled do not stop at the problem definition, nor at the fact that both are readying new systems. They also include the way both are approaching the solution, and to quite an extent, to the chosen solutions.

Both Pringle and McLaughlin have selected non-data processing specialists to effectively design the new systems. They have both created basic record formats which are quite different from what a pure DP-oriented specialist might have developed.

In doing this they both seem to have developed potentially super useful systems for their own cases, beyond what they might have done if they had relied on the visiting DP specialist.

Court Scheduling

In the court scheduling problem, the two normal record units are:

- Arraignments and appeals – i.e., a set of charges.
- Defendants – i.e., a set of people.

There is also a list of resources (courtrooms, docket lists, etc.).

The basic problem has been that when a case is set for trial it takes so long for it to work its way up the list that practically all the work has to be redone when it reaches the top of the list. In addition, the scheduling has to take into account the frequency of case postponements, either for the attorneys to prepare their cases, to find missing witnesses or simply to be physically available.

The traditional method – arranging cases by the list of charges and allocating resources (courtrooms, prosecuting officers, etc.) shortly before the matter comes up for trial – has almost broken down, but the apparent alternative of arranging the cases by the people involved instead of by the charges shows little promise of being any better.

The solution adopted by the people in the district attorney's office was to take the "triable charges" as the basic unit – the group of charges and group of defendants which could be tried together – and to organize the files around the records.

This solution permits the work in the case to start long before it could previously, when it was not known just who would be in court together.

With the new record unit, however, not merely does it become easy to schedule the courtrooms but it also becomes easier for trial preparation to take place, thus reducing (hopefully) the number of wasted courtroom appearances.

Under McLaughlin's scheme, in fact, he is insisting that pretrial conferences start within 30 days of the arraignments and include details of possible plea-bargaining, allocation of a responsible district attorney to the case, etc. All to be put in writing and made a part of the record. As a judge, he has and uses his power to command. He can therefore look forward to many advantages which are outside those that occur simply by having a DP specialist come in and "solve" a user's known problem.

Hotel Has No Power

In the case of the Plaza Hotel, the accounts receivables problem has been in both the identification of the customers (you try getting a man's full address after a long night in the cocktail lounge!), and the human problems that arise when the system breaks down. The hotel doesn't have a judge's power of command so it needs a very different system.

Again, the key decision came from DP-knowledgeable users at the time when they decided the basic file structure. In this system, Pringle said, they regard *anyone* who has successfully managed to charge something as a new customer *unless* they can positively identify him as a standing customer.

"It may increase our postage bills a little, and inflate our customer counts, but it will keep down the incidence of inaccuracy," Pringle said. "In the hotel business, where the good will of every single customer matters to us, we don't want to have customers with justified complaints. This way, we shouldn't have such complaints," he added.

Multiple Statements

One thing that does come from the system is that customers can get multiple statements, with different items on each but not consolidated. In many DP operations, this would make the system impractical, because discount rates could depend upon the total volume, but for the hotel, the only problem is the slight annoyance of receiving the separate billing. And the attitude of "Sorry, but we have to go carefully with computers, and it *would* be nice if we always knew your full name" appears to handle that very well also.

In short, it appears as though in these 1974 applications the appreciative amount of internal DP expertise in setting up basic data designs is the key to success, and that the user is getting more from his specialized knowledge than he would from knowing the differences in hardware or software.

This also is a technical revolution which data processors have to factor into their future thinking and planning.

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What's Real About VS? — Part II

New Features Focus on System Problems

By Bernhard W. Romberg
Special to Computerworld

OS users should plan on a conversion to a VS environment within the next 12 months.

The conversion process can be simplified by going first to VS2/R1, to acquire systems and operational experience with the VS systems. Then, one can wait with the conversion to VS2/R2 until such time as this wholly new system reaches a fairly steady state of operation.

All of the VS operating systems provide important capabilities in addition to the more flexible memory management of "virtual storage."

For instance, the manner in which JCL is processed has long been a cause of aggravation. Some checks are made by the reader as the input is spooled; however, a full check and translation to internal form does not occur until later.

The result of this is that a debugging job may be delayed until all the necessary resources are available and the job is about to begin, only to have it abort because of an error in data set conventions. This slows down turnaround, impacting program development.

With VS2/R2, this problem has been, or perhaps we should say will be addressed, with the JCL being converted to internal format with full syntax checking at the time it is read.

Hasp Improves Spooling

Spooling, particularly of printer output, was a particular source of aggravation in MVT. With Hasp, this was improved significantly and the Hasp mode of spooling has been largely continued in the VS systems, although VS2/R2 provides certain internal refinements.

This series was extracted from a report evaluating IBM's VS, prepared by and available from ADL Systems, Inc., Acorn Park, Cambridge, Mass., 02140. The author, Bernhard Romberg, is president of ADL.

The problems of checkpoint/restart, to save output in the case of job failure or troubles during the printing operations, were also addressed to some extent with Hasp, and these improvements have also been refined further with VS2.

Finally, there are the spooling problems associated with OS extensions such as CRJE and TSO. Some bridging for CRJE has been provided with Hasp and continued in VS2/R1, but it is not until VS2/R2 that the respooling requirements for TSO will be an integral part of the operating system.

MVT had certain job scheduling capabilities through classes and priorities within these classes. However, this provided little flexibility for control of the work over very short intervals while the processing was being done.

Furthermore, there were certain aspects of the systems architecture which brought about particular inefficiencies. A big step forward was taken with Hasp. These enhancements have been largely continued in VS2/R1. VS2/R2 includes a significant extension, with the capability of allocating CPU resources depending upon the extent to which a job is meeting its schedule objectives.

In MVT, and also in Hasp, I/O devices were allocated in a single-thread manner, so that there could be considerable delay while waiting for a particular device to be allocated. In VS2/R1, there is an improvement in the allocation algorithm which will lead to better balancing of I/O over channels. In VS2/R2 there is to be a significant further enhancement, with the possibility of parallel allocation of devices in different I/O groups and the capability of allocating and releasing a device during a job step.

Operating System Problem Area		MVT Hasp	VS2/ R1	VS2/ R2
JCL Screen				√
Spooling	Efficiency	√	√	√
	Checkpoint/ Restart	√	√	√
	CRJE, TSO			√
Scheduling	Work Flow			√
	Job Queue	√	√	√
	Resource	√	√	√
Device Allocation			√	√
Memory Management	Fragmentation		√	√
	Full Region Needed		√	√
	Dedicated Requirement		√	√
	Protection		√	√
Graceful Degradation and Reconfiguration				
Tuning	Operating System		x	x
	User Systems		x	x
	Monitoring Tools			

Compared with conventional MVT, new operating systems have – according to ADL report – made "substantial improvements" in some areas (marked by √), while creating problems in others (marked by x).

Of course, memory management was the major problem addressed by VS. With MVT, a job required a fixed amount of core and, for all practical purposes, once loaded that core was reserved until the job was completed.

Some improvement came with Hasp, which permitted core allocation by step. However, the problems that occurred with core fragmentation or the converse problem of requiring a large region of core for a particular job was not addressed.

Other problems arise in memory protection, such as when one job refers to space utilized by another job (as may arise when a program index is functioning improperly and goes outside the region of a job). All of the VS systems provide significant capabilities to address these problems. From a functional standpoint (i.e., from a user's viewpoint), VS2/R1 already provides a major capability. This is further enhanced by internal improvements incorporated in VS2/R2.

One important capability still not adequately provided with any of the operating systems is the facility which is sometimes termed "graceful degradation." Such a facility is provided in equipment from certain other vendors, but has not yet been adequately incorporated in the IBM product line.

Effective utilization of the operating systems requires that users have the capability of tuning them to meet their own configurations and operating environments.

Although the facilities to monitor systems performance have improved, they still fall short of what is truly needed for effective measurement. For instance, the operating systems themselves do not provide any capability to monitor what goes on within an applications program or the operating system itself, although proprietary packages have been developed by others to provide such a capability.

'Cobol Companion' Eases Coding, 'Syncsort' Update Cuts CPU Time

FORT LEE, N.J. – OS/360-370 users can acquire better utility support with two updated packages from Whitlow Computer Systems, Inc.: Syncsort III and Cobol Companion.

The new sort utilizes the same basic techniques that enabled the original Syncsort to outclass IBM's sort, but has been optimized so that the features of Syncsort II, once limited to large-scale systems, are now available for any OS machine.

Coding changes to improve operations in a VS environment have been added, as have modifications to cut CPU time. The handling of variable length records has been improved, the company noted.

Syncsort III is available on a three-year lease plan for $6,250.

Cobol Companion is an extensive reworking of the Mircle Cobol preprocessor system originally developed and marketed by Republic Software Products, Inc.

Companion allows programmers to work quite freely since the preprocessor includes an edit function matching input against installation standards and generating final source output that is in line with the standards.

Paragraph cross-references and data name cross-references are added in-line on the listing that comes out of Companion. Formatting also includes paragraph numbering options, PICTURE alignment and uniform indenting of conditionals.

The initial release of the package also includes support for COPY functions and Macro facilities.

Written in Cobol, Companion will run on any OS-based configuration. The three-year lease price of $5,000 includes maintenance and all enhancements produced during the lease period, the company said from 222 S. Marginal Road, 07024.

Small Series 90 CPU Coming?

BLUE BELL, Pa. – A transaction-oriented information management system first announced for the Univac 90/60 and 90/70, IMS/90 will be available to Univac 9400 and 9480 users in October. An emulator allowing Univac 9200/9300 programs to run on the 9400/9480 CPUs will also be available then, the company added.

This surprise support for the smaller 9000 Series users is seen by some as a hint that Univac's Series 90 – made up now of the high end of the 9000 line – will be extended downward within a year.

IMS/90 includes a Data Definition Language making data files accessible to application programs through references to data field names. Data base quality is maintained, Univac, said, through password protection, data validation and file rollback capabilities.

IMS/90 includes Unique, a retrieval language controlled by user-supplied selection specifications, and functions in multi-thread mode so that work can move forward on several terminal requests concurrently.

IMS/90 requires a 98K main memory.

The Emulator Control Program (ECP9300) supports 9200/9300 Job Control, sorts, utilities, libraries and compilers as well as application programs.

ECP9300 itself runs as a regular OS/4 job, accessing the 9300 supervisor which must be loaded in the 9400/9480 memory along with the user's programs. ECP9300 uses 12K to 16K bytes of memory in addition to the memory requirements of the transplanted supervisor.

Emulation requires installation of several printed circuit boards as well as the software.

The PC boards can be purchased for $1,500, plus a $150 field installation charge if retrofitted on 9400/9480 systems already out in the field.

To run 9200/9300 emulation, Univac recommends a 9400 or 9480 with at least 65K of main memory.

Both IMS/90 and ECP9300 will be free to 9400/9480 users.

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DP DIALOG

Notes and observations from IBM which may prove of interest to data processing professionals.

With this issue, DP DIALOG makes its debut in these pages and will appear regularly. As its name suggests, we hope DP DIALOG will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP DIALOG, IBM Data Processing Division, White Plains, N.Y. 10604.

With virtual storage Carle Clinic now has much greater flexibility in its data processing capabilities. One of the future uses will be medical applications, such as analyzing data gathered in the clinic's laboratories.

Why Carle Clinic Switched to Virtual Storage

The list of families using the Carle Clinic in Champaign, Illinois spiraled 75% in the last five years to over 35,000. The resulting flood of paperwork kept its IBM System/360 Model 20 running nearly 300 hours a month. "Even so, we still weren't able to keep up," says Ed Beranek, data processing manager for the clinic as well as the adjoining 250-bed hospital.

"But even worse," he continues, "we had more paper than we knew what to do with. Every week the accounts receivable, alone, amounted to a 3,000-page report. What we needed was not to get more information into the computer but to have more information available on-line."

Carle Clinic, one of a half dozen medical groups of its kind in the country, is the largest group medical practice in Illinois. Its staff consists of over 80 physicians, who are all specialists in their fields. They service 180,000 patients—about half from the surrounding area, the other half from all over the country.

The clinic solved its problem of expanding needs by converting to an IBM System/370 Model 125 with virtual storage last summer. "We found the Model 125 would not only justify our immediate needs, but would also allow us to grow on a long-range basis. Virtual storage gave us that capability without increasing the actual size of our computer," says Ed Beranek. "We also added CICS (Customer Information Control System) which made it possible to access information directly from the CPU for display on a teleprocessing unit."

All in all, the conversion was relatively trouble-free. In fact, Beranek reports they were able to convert to DOS (Disk Operating System) in only two days instead of the seven originally planned. They later went to DOS/VS and finally CICS in a matter of a few weeks.

The clinic's Model 125 has been up and running since last July and already it has streamlined the business functions, such as accounts receivable, payroll and inventory. Other applications, including patient scheduling and some doctor/patient statistics, have been added.

"So far we have had great success with the 125, but we are only on the threshold," says Beranek. "The 125 with virtual storage now makes it possible to add many more applications. By the end of the year we will be able to include both an on-line insurance billing and medical retrieval system. This will enable doctors to see in an instant a full account of a patient's recent visits to the clinic."

Beranek feels there are many more medical applications for the computer. One possibility is incorporating the System/7 for EKG analysis and other medical functions which demand monitoring. "Over the long range we are interested in giving the best possible care to our patients. If the computer can help us we're interested in using it."

IBM

Library Thrives with No Books, Few Visitors

Instead of books, this quiet library, located 30 miles north of New York City, houses a vast collection of computer programs. It is IBM's Program Information Department (PID) which works around the clock to fill customer orders for computer programs.

The master library contains roughly 2,500 operating system and application programs for manufacturers and financiers, wholesalers and retailers, food and chemical processors, scientists and engineers. Besides adding to the master library regularly, IBM program development groups also update and modify existing programs when necessary.

Every year PID distributes over 300,000 packages containing program material—more than 1,200 each working day. A computer processes the mammoth volume of orders from the time they arrive to the time they are packaged and mailed. The turnaround time is usually about one week, according to Marty Kloomok, PID's manager. "But in an emergency," he says, "we can have a program in a customer's hands in 24 hours."

After PID's computer receives and edits the order data, it copies the master file onto the specified medium—either a disk pack, magnetic tape, card deck or a tape cassette. The copy is checked against the original for any errors and is sent to the customer with the appropriate documentation, which tells him how to install and use his program. Finally, the package contents are checked against a computer-prepared packing list and shipped with a computer-prepared mailing label.

New orders for processing arrive at IBM's computer program library.

In this way IBM, through its program library, is helping its customers to optimize the effectiveness of their computers—to make them more valuable assets.

IBM

Space and Astronomy at the IBM Exhibit Center

When the Comet Kohoutek made its parabolic path around the sun earlier this year, the IBM Exhibit Center in midtown Manhattan made it possible for passers-by to observe its path on a floor-to-ceiling graph, visible through the windows on the center.

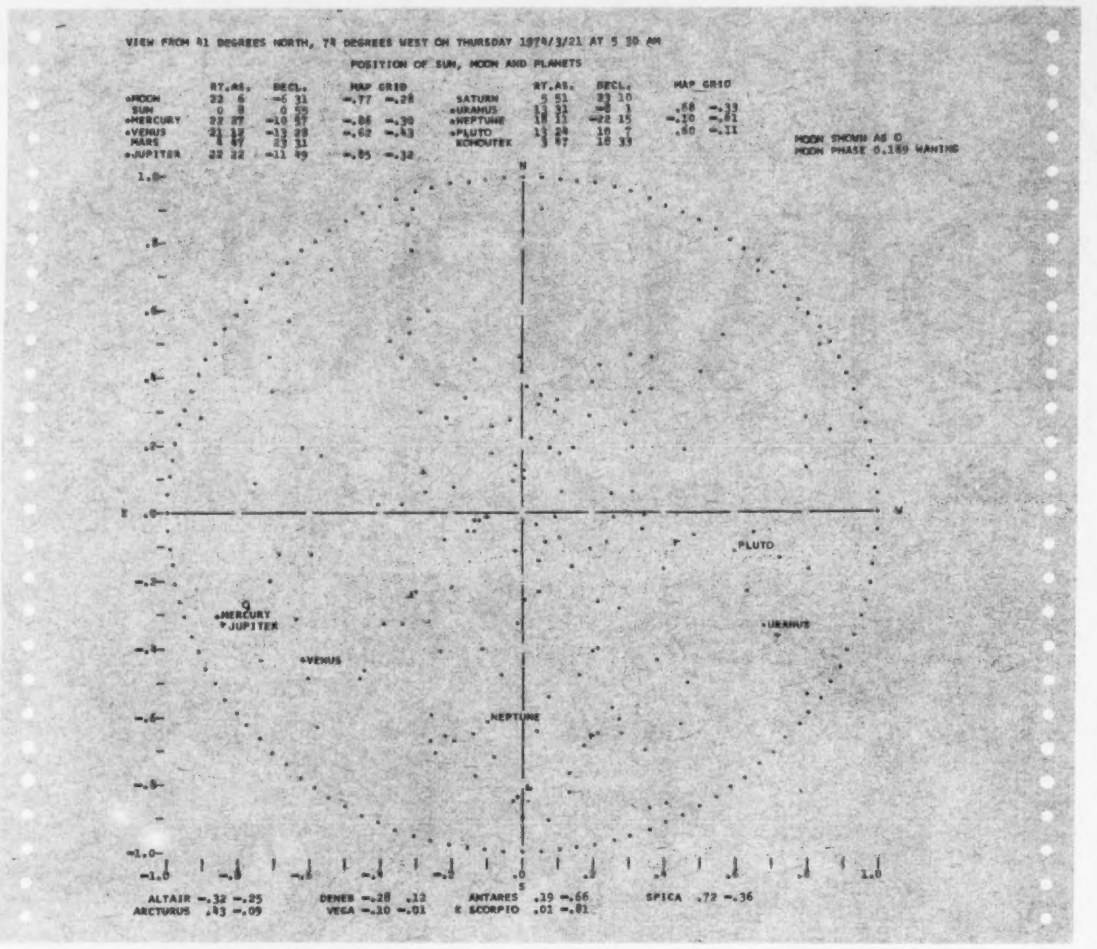
Inside the center a terminal linked to an IBM computer plots the exact position of Kohoutek. Although the comet is now beyond our view, the computer program will continue to plot the position of the planets, the major stars, the sun and moon as seen from any point on the earth, at any time.

The chart at right shows how the sky above Manhattan looked just before sunrise on March 21, not long after Kohoutek disappeared into the outer reaches of the solar system.

The IBM star chart is only part of a much larger exhibit designed by the office of Charles and Ray Eames for IBM, with the help of I. Bernard Cohen, Professor of the History of Science at Harvard University.

Titled "computer perspective: ASTRONOMY," the current focus is on the men who laid the foundations of modern astronomy and physics, from Nicholas Copernicus in the fifteenth century and his revolutionary theory of the sun-centered universe, to Sir Isaac Newton in the eighteenth century, who completed the Copernican Revolution with his formulation of the principle of universal gravitation.

Like the other computer exercises at the center, the star chart exercise shows how the computer can help provide sophisticated data based on these early scientific principles. **IBM**



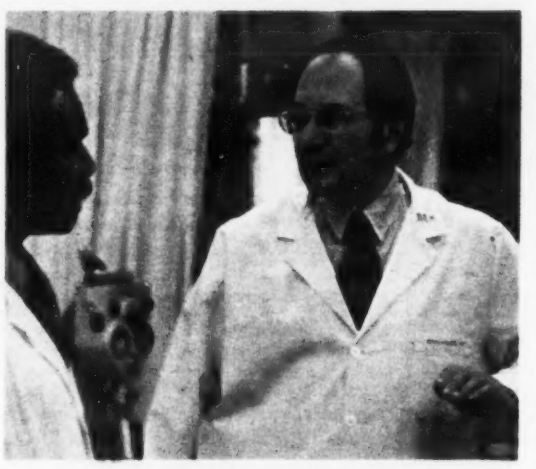
Helping Doctors Combat Heart Disease

Heart disease is still the nation's number one cause of death, in spite of vast improvements in cardiovascular research. Many patients with severe coronary artery disease must undergo open heart surgery as a last resort. Now scientists are conducting research on how computers can help a surgeon's diagnosis by measuring the heart's pumping capacity and automatically pinpointing defects.

Dr. Chao-Kong Chow, a computer scientist, and his associates at IBM's Thomas J. Watson Research Center and Dr. John Siegel, Chief of Surgery at Buffalo General Hospital, have found a way to use the computer to analyze cineangiograms, or X-ray motion pictures of the heart, by measuring precisely the volume change in the blood-pumping capacity of the heart.

Siegel explains: "Without the help of a computer, sometimes it would take days, even weeks to fully interpret cineangiograms. If the patient's very sick, he could die in that period of time. Now, with computer assistance we can get a more accurate analysis in a very brief period of time, sometimes less than an hour."

Siegel and Chow have concentrated their research specifically on the left ventricle of the heart. Here the change in volume as the heart pumps is a key indicator of heart performance. They took cineangiograms of movement in the left ventricle, recorded at 62 frames



Dr. Siegel explains how computers can help a surgeon's diagnosis.

a second, and converted them to computer-usable form with an IBM 1800 data acquisition and control system. The results were fed into a System/360 Model 91 for further processing.

"A typical 68-frame sequence, which would cover one full cycle of a heartbeat, can be analyzed in less than five minutes," says Chow. But he emphasizes, "the ultimate speed is not as important as providing an automatic technique where none now exists."

Beyond speed, there are several functions the computer can perform on an angiogram which would otherwise result in a long, painstaking and even inaccurate procedure if done by hand.

"In fact," explains Siegel, "the computer can go one step further and 'cross-section' the angiogram and calculate the ways in which each segment of the ventricle contracts. This is especially useful in diagnosing irregularities in the pumping cycle, the rhythm of the cycle and partial malfunction in a specific part of the heart."

"When we find an impairment on an angiogram, we can easily run successive ones on the computer and compare improvement or decay in condition and changes in overall performance or in performance of certain segments."

Although the work of Drs. Chow and Siegel is still in the research stage, both are optimistic about the real possibility that computer-produced cineangiograms can provide valuable information needed to diagnose a large number of patients with severe heart disease. "In this way," says Siegel, "we can make intelligent decisions as to whether patients should undergo open heart surgery for revascularization, or the rerouting of blood vessels feeding the heart." **IBM**

Sidelines

Computers at Sea . . .

Even with today's sophisticated radar systems, collisions at sea do happen. Last year alone 300 major vessels of 500 tons or more collided. The problem is that radar can not differentiate between obstacles, from buoys to ships, on a ship's path.

IBM recently announced its Maritime Applications Bridge System which may help to overcome the problem. The system uses a System/7 computer and a variety of applications programs. One of them, the collision assessment program, can automatically identify targets up to 16.5 nautical miles away. It can also differentiate between ships, debris and land masses. Objects are flashed on a screen with vectors and are identified on an adjoining screen by number, range and bearing, speed and course, and estimated closest point and time of approach.

The Bridge System offers another advantage—planning the ship's optimum route to conserve fuel. Programs for position fixing, route planning and tracking, and adaptive autopilot keep the ship's officers constantly informed of the ship's exact position and the course it should follow.

An IBM Maritime Bridge System helps keep ship on course.

Coping with the Energy Crisis

Recently, IBM announced its new computer-based Energy Management System, which is designed to help electric utilities produce power more efficiently.

It also makes it possible for these same utilities to monitor and control a complex network of electrical generating and transmission equipment much faster than if it were done manually.

The new system combines IBM System/370 and System/7 computers with a set of special application programs, data collection and display units.

By consolidating all power information in one spot, it gives a dispatcher the data he needs to determine how to distribute the power load among the generators in a utility system. As consumer appliances and industrial equipment are turned off and on during the day, the dispatcher can boost the power from the most efficient generators and decrease the electricity from the less efficient ones.

Other advantages include keeping track of fuel and maintenance costs, transmission line losses and the status of all pieces of equipment so as to achieve minimum production costs and efficient use of available fuel.

IBM

'CVS' Backs Virtual Nova

MANHATTAN, Kan. – Users can execute Basic programs with as many as 64K statements on an 8K Data General Nova with the CVS/72 virtual storage operating system from Computer Systems Design (CSD).

The system includes support for indexed sequential as well as direct access files. File management techniques allow data fields to be added or deleted without modifying the existing programs that read the files.

Spooling of output for the relatively slow printer and of job control commands improves system utilization and allows the Nova to run unattended.

Even a Trace feature has been added to help in program debugging, the company noted.

Disk file records may have 256 separate fields, with field sizes up to 131,000 characters each in strings.

User access to both files and fields within files is controlled by password.

Basic has been extended under CVS/72 to include business-oriented editing and print formatting functions, and longer labels than in standard Basic. All mathematical operations are fixed-point arithmetic.

The system requires an 8K main memory, 256-word sector moving-arm disk, two disk drives, and a teletypewriter or CRT terminal with keyboard.

CVS/72 can be purchased for $2,950, from P.O. Box 972, 66502.

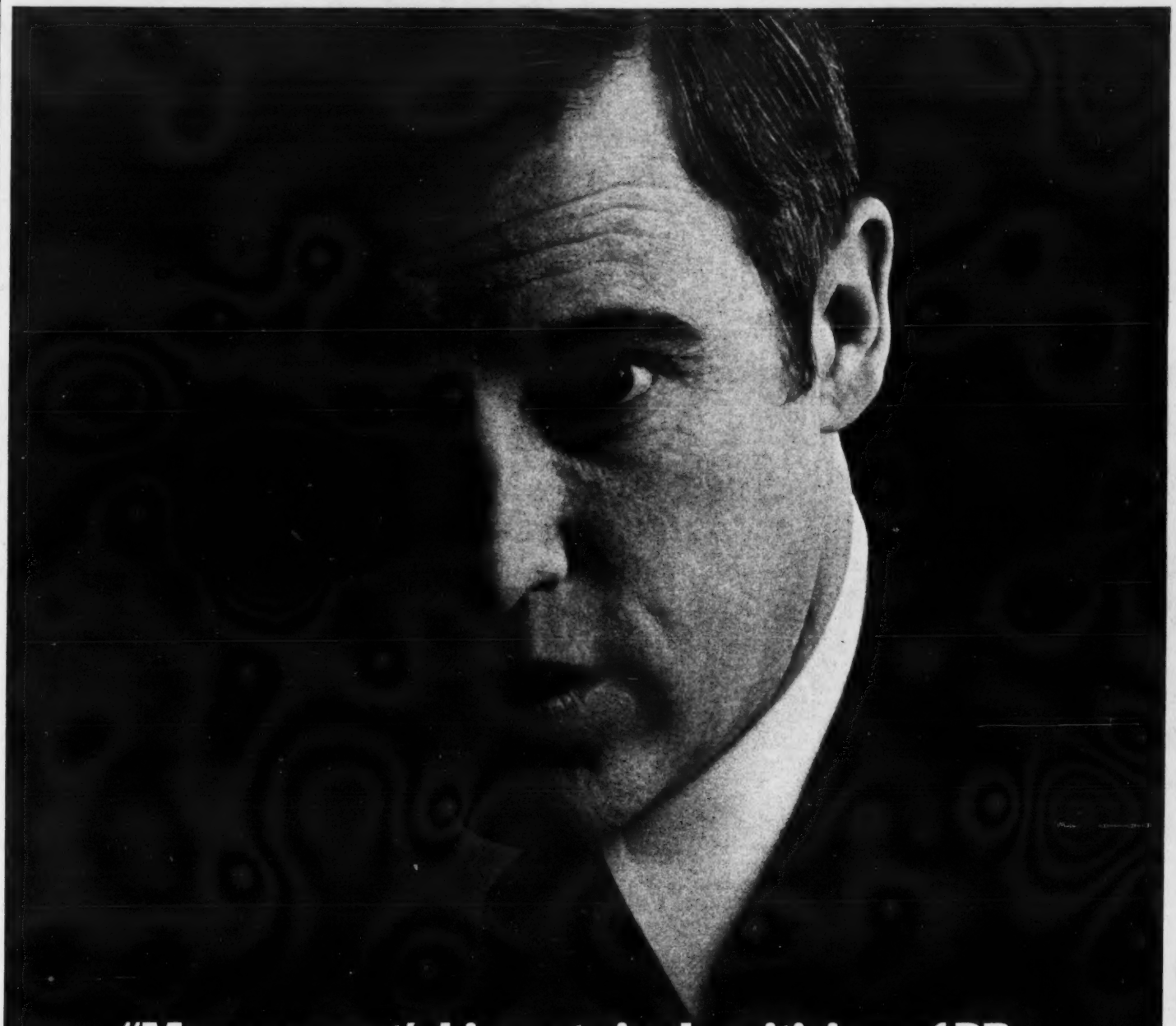
'Iris' Controls 32 Users on Nova

NEWPORT BEACH, Calif. – A file-oriented business time-sharing system for Data General Nova minicomputers, Interactive Real-Time Information System (Iris), from Educational Data Systems can support as many as 32 users, depending on core and disk.

Iris includes Business Basic (with extended precision decimal arithmetic and formatted output), a report writer, assembler, text editor and computer-assisted instruction (CAI) support.

There are also four application modules: accounts payable, accounts receivable and inventory; general ledger; payroll/personnel; and school budgeting.

Iris costs $5,500 and quantity discounts are available from 2415 Windward Lane, 92660.



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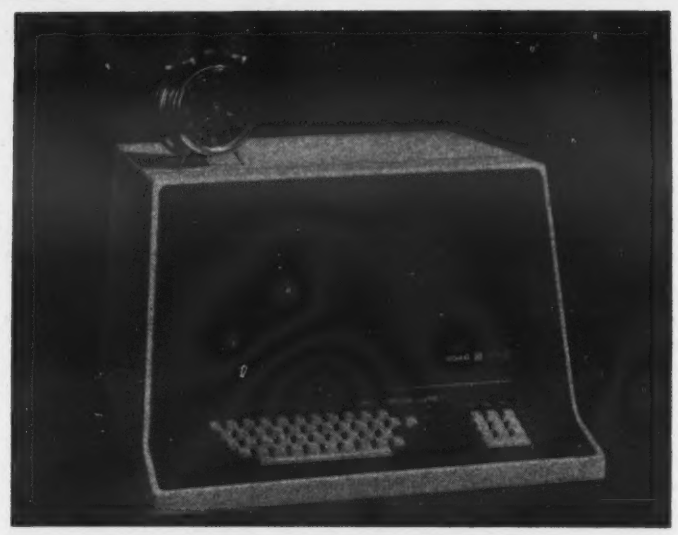

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Air Freight Alternative: MCI Moves Tape Images

WASHINGTON, D.C. – MCI Telecommunications Corp. has introduced a service that will provide point-to-point delivery of tape files in as little as two hours.

The Data Express service utilizes MCI's communications network to transmit the contents of computer tapes between the company's terminals at speeds of 250 kbit/sec

The service is seen as an alternative for those users who nightly ship their computer tapes to various points around the country.

The Data Express user normally delivers the tapes to be transmitted to the MCI terminal and makes arrangements to pick them up at the receiving terminal, but a delivery service could also be used.

Delivery of the transmitted data can be as fast as two hours for high-priority items but normal turnaround would include overnight service, a spokesman said. Initially the Data Express service will be offered between New York, Chicago, Washington, D.C., Dallas and Houston beginning next summer.

Rates will vary depending on priority and distance but prices are expected to range from $25/reel to $400/reel for high priority data. Any standard 7- and 9-track tapes recorded at densities between 200- and 1,600 bit/in. can be handled by the service and the company will optionally provide transmitted data in printed form.

Because of error-correction techniques built into its transmission system, "MCI can guarantee that the delivered tape will be an exact duplicate of the original," a spokesman said.

'Bowpos' Backs Basic/4

SANTA MONICA, Calif. – Availability of the Business Oriented Word Processing On-Line System (Bowpos) from Richard V. Reynolds may indicate the start of software support from independent sources for users of the Basic/Four small computer.

Bowpos was developed, Reynolds said, to provide users with English-like commands and worthwhile error detection and diagnostic messages in support of generalized text editing and report generation. Part of the basic package also includes facilities for printing in upper and lower case.

Special features enable users to extend the package to meet particular needs. One such option, for example, provides MTST replacement capabilities and support for personalized form letters; another works with mailing lists and stored paragraphs to create generalized form letters.

A third option produces technical manuals and catalogs through printing of complete updated text files, with automatic page numbering. Though Bowpos can handle print lines from 20 to 80 characters long, another option permits wider reports.

The basic text editing includes creation, maintenance and deletion of textual files. In addition, facilities for both right- and left-justifying of printed columns, and for reformatting previously edited files into new layouts, are part of the package.

Bowpos runs on a minimum Basic/Four configuration and costs $2,500. The special feature options cost $1,000 each, except the Output Format Design module (for wider reports) which sells for $250.

Reynolds is at 2210 Third St., 90405.

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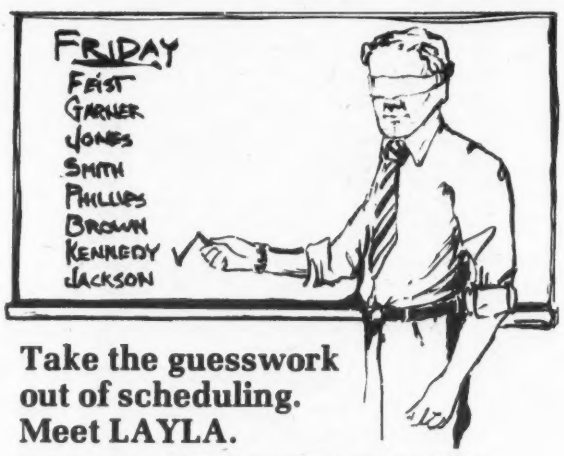

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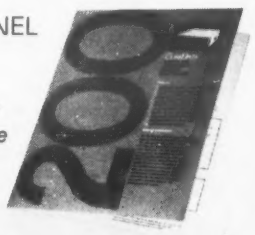

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Data User Saves 40% With Datran Link

By Ronald A. Frank
Of the CW Staff

DALLAS – One of the first Data Transmission Co. (Datran) users is saving more than 40% on his monthly phone bill between Dallas and Houston.

The Dallas Independent School District accesses a regional computer center in Houston to process immunization and demographic data for about 120,000 city students. The school district had been using an FX (foreign exchange) line provided by Southwestern Bell for $808/mo, according to Herb Hanus, management information coordinator. The Bell facility actually cost $708/mo with the other $100 going to the rental cost of a Rixon modem at each end of the line.

The Datran link costs Hanus $468/mo including two Paradyne 4800 data sets. The modems serve as the Datran "customer interface." Later when the specialized carrier begins switched service, it plans to provide a more sophisticated interface called the Data Communications Console (DCC). The monthly Datran cost breaks down to $150 for each data set and $168/mo for mileage. This is based on 224 miles at 75 cent/mile.

The school district transmits card image records from Dallas to Houston using a DCT-132 terminal, originally made by Scientific Control Corp. and now supported by Consultronics, Inc. in Dallas. The DCT-132 is a remote batch terminal which includes a 300 card/min reader, 300 line/min printer and an 8K mini, and costs $700/mo. Cards are punched on 029-type keypunches.

The Datran line went into operation Jan. 15 and has experienced only one outage, Hanus said. The problem was traced to the Paradyne 4800 modem supplied by Datran and a backup unit was delivered in a half hour, the user said. He contrasted this with the response time of Southwestern Bell which ranged "from four hours to the next day."

From the school district office, the link includes a Southwestern Bell 4-wire circuit to the Datran technical maintenance center about seven miles away. At the maintenance center, the analog signal is converted and multiplexed into a 21.504 Mbit/sec data stream to the Cedar Hill transmission center.

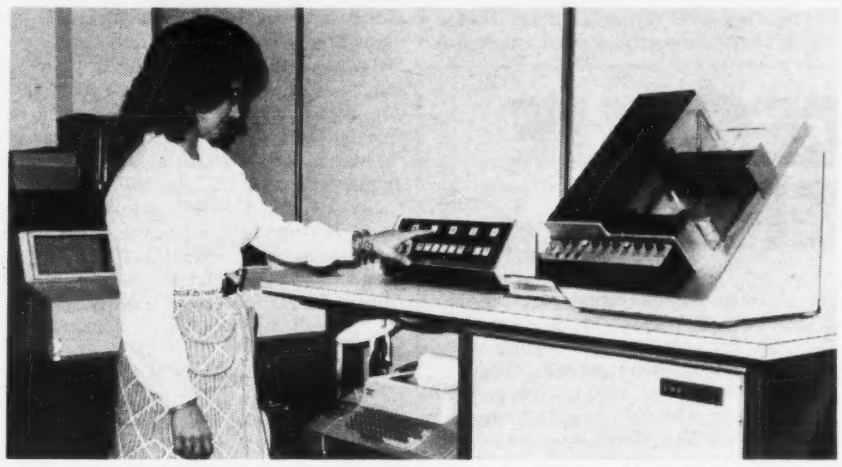
From Cedar Hill the signal is transmitted along the "backbone" to Houston where it is demultiplexed and sent to the Houston center over similar Bell 4-wire local loop.

At Cedar Hill, Datran has a specially adapted Burroughs B700 fault alarm and control system which monitors "about 100" important parameters in the transmission system. The Datran long-haul system uses Nippon Electric transmission equipment which can be switched in "5 nsec" to a backup facility in case of trouble, according to Steve Omelan, technical controller.

By switching in less than one-bit time, alternate facilities can be used without the customer's data stream dropping a single bit, he said.

In addition to the Burroughs control system, Datran uses a Halcyon 500 line test system to check the quality of local loops supplied by the phone company. This system can isolate such problem areas as phase jitter, amplitude distortion, delay noise, impulse noise and harmonic distortion.

If necessary, Datran will add its own conditioning to a local loop before providing the line to a customer. Up to now Southwestern Bell has cooperated in supplying good quality loops for Datran customers, a spokesman for the new carrier said.



Veronica Vera operates remote batch terminal at Dallas school district. Data is transmitted to Houston DP center over Datran line.

CW Photos by Ronald A. Frank

Steve Omelan, Datran technical controller, checks line quality of Bell local loop with Halcyon 500 test system.

Sigma 9 Handles 64 Low-Speed 'Mats' Circuits

FRANKLIN PARK, Ill. – "From a user's standpoint, there's just no question that reliability is the most important attribute of a time-sharing service," said Dr. Edward F. Staiano, manager of Motorola's newly launched Midwest Area Timesharing Service (Mats). Computer uptime since Mats went on the air last August has averaged better than 95%.

Mats supports a broad range of scientific and engineering activities at Motorola's corporate and division locations in Chicago as well as divisional facilities as remote as Toronto and Fort Lauderdale.

Any user at these facilities has access to the Mats Xerox Sigma 9 computer system, operating under the Xerox Control Program-Five (CP-V) operating system.

Currently there are approximately 350 accounts which regularly use Mats. Each account typically represents a department and many have multiple users.

Private Phone Net

Access to the Mats Sigma 9, located in Franklin Park, Ill., is via Motorola's Di-Tel, an extensive private telephone network. From 7 a.m. until 11 p.m., seven days a week, a user is guaranteed computer access either for interactive problem solving or for remote-entry batch processing.

The system has 64 asynchronous lines linking on-line terminals at the various user points. Data transfer speeds range from 10- to 30 char./sec.

Multiplexers support both remote batch and time-sharing terminals at Fort Lauderdale and other major company facilities. On-line remote batch controllers include card readers, printers and satellite computers.

The Mats management group expects to install additional disk storage to increase storage capacity by a factor of six, Staiano said.

Although the primary function of Mats is to support company scientists and engineers, the time-shared CPU is not restricted to these areas of activity.

The Display Products Group, for example, uses Mats to check out in advance the feasibility of proposed operations- and information-oriented data processing systems. This group reports increased efficiency and substantial monetary savings as the result of their time-shared computer use in design and development.

Interface Links HP CPUs

PALO ALTO, Calif. – A high-speed serial interface that links HP 2100 computers has been developed by Hewlett-Packard's Data Systems Division.

The hardwired interface card, designated HP 12889A, enables asynchronous data transfer at 2.5M bit/sec at distances up to 1,000 feet and up to 1.25M bit/sec at distances up to 2,000 feet. It plugs directly into the I/O structure of the 2100.

The interface card sells for $750 and is supplied with a software driver that is compatible with HP's data communications-oriented disk-operating system, DOS-III.

The company is at 1501 Page Mill Road,

User Sessions Set At ICA Conference

NEW ORLEANS – The International Communications Association (ICA) will feature a user-oriented program during its annual conference May 5-10 at the Fairmont Hotel here.

One session to be presented by ICA members will have an evaluation of front-end processors by Jack Farris of Borg Warner Corp. and a discussion of the IBM program impact on peripheral equipment by Robert Madan of Equitable Life.

Panel sessions set for the conference will have representatives from the specialized carriers, satellite vendors and international carriers. A meeting on regulatory issues will include Walter Hinchmann, new chief of the FCC's common carrier bureau; Sebastian Lasher from the Office of Telecommunications Policy; and Hugh Wells, a regulatory commissioner from North Carolina. Member session topics will include interconnection and message/data switching techniques.

About 100 vendors will be represented at the exhibition held in conjunction with the technical sessions. Registration information is available from James D. Martin, National Steel Corp., 700 Chatham Center, Pittsburgh, Pa. 15219.

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2780 Emulation Overcomes Mainframe Incompatibility

By Patrick Ward
Of the CW Staff

HOUSTON – Mosher Steel Co. here plans to sidestep a problem of mainframe incompatibility by linking various vendors' key-to-disk systems together and emulating IBM 2780 transmission.

Mosher Steel uses a 192K IBM 360/40 for its DP needs. But the company is a subsidiary of Trinity Industries in Dallas, which handles its own DP work with a Burroughs B3500.

"There's just no convenient way you can interface those two computers to ship data back and forth," Jack Haigh, DP manager at Mosher, stated.

However, Trinity does Mosher's accounts payables, accounts receivables and general ledger processing using programs on the B3500. Mosher keys in the source data and edits it on its 360/40. Then a courier service takes the cards and tape to Trinity for processing.

"At month-end when you're shipping accounting data back and forth trying to close your books, you have a heck of a time getting it done," Haigh remarked.

Installing Key-to-Disk

But later this year, Trinity will install an Inforex 1301 system which, by emulating IBM 2780 transmission, will be able to communicate over dial-up lines with Datapoint 2200 and CMC 5 key-to-disk systems at Mosher.

Then "we'll just communicate between the CMC and the Inforex, or the Datapoint and the Inforex," which would create a tape for the Burroughs system, Haigh observed.

Haigh said that when he was considering replacing the 10 Univac 1700 keypunches in the Mosher DP department, he looked at key-to-disk systems that could emulate the IBM 2780, and he and his counterpart at Trinity, Dave Rochier, agreed to use 2780 emulation as the standard.

The CMC 5, installed in the DP department, "is very good as far as keypunch replacement is concerned," Haigh said.

The recently acquired Datapoint system has stations in the treasury and accounting departments, where Haigh expects the machine's more complex editing capability can help workers keep data entry errors at a very low level.

User Casebook

IBM 2780 emulation allowing direct transmission between Mosher's Datapoint and CMC units was "very simple," Haigh noted. "It's all vendor-supplied software."

However, some reprogramming, centering around emulation options provided for on the CMC but not the Datapoint, was necessary, he mentioned.

The two systems are in the same building, and communicate through synchronous communications adapters and Bell 201A3 modems, he said.

Presently, the Datapoint unit transmits batches of data which the CMC unit prepares on its 9-track magnetic tape unit.

With an IBM 270X or Memorex 1270 communications controller, Haigh surmised, the 360/40 could be adapted to receive batched data directly from the key-disk systems that had dialed into it.

With the necessary Job Control Language (JCL) stored on a mini processor's disk, the control clerk could give commands to a mini processor to merge keyed and verified data with the appropriate JCL, and to transmit an image of that data to the 360/40, Haigh stated.

However, "I don't know of a key-disk system yet that interfaces with the Burroughs directly," he remarked. All a vendor would have to do for such an interface is "pick up the protocol for one of the Burroughs terminals and write the appropriate program," he said.

Any of the key-disk mini processors could collect data from the other key-disk systems and assemble it into a job, Haigh said. This capability would be useful, he added, for a user running only one job payroll, but with several plants preparing the data.

When all the plants had submitted the payroll information, the data control clerk could merge the data with its JCL and transmit the job to the 40, he explained.

This approach would be faster, save manual card and tape handling and be less prone to error, Haigh added.

And this is one way he could tie diverse key-to-disk systems in various plants together through 2780 emulation.

Another Trinity subsidiary in New Orleans with an IBM System/3 is in the process of installing IBM 3740s for communication between New Orleans and another point in the state.

Haigh said he is not yet sure whether that synchronous protocol will interface with his 2780 emulation net or not. But if it does, he said, "then we've pretty well linked the whole company up without having to worry about interfacing the mainframes."

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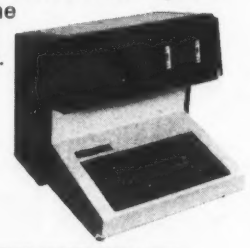

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See the Sycor 340 with Flexible Disk option at the National Computer Conference.

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Sherry Says...

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ICC If you have questions or topics you would like to see in our column, send them to: **"Sherry Says" c/o: International Communications Corporation 7620 N.W. 36th Avenue Miami Florida 33147**

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Bits & Pieces

360/44 Core Replacement Quadruples IBM Limit

FORT LAUDERDALE, Fla. – The Smart 440 core memory replacement for the 360/44 can quadruple the IBM memory limit of 256K.

Available from Standard Memories, Inc., the core replacement comes in 64K-byte increments up to 256K and in 128K-byte modules when expanding beyond the 256K IBM limit.

A switch is incorporated to logically restore the CPU to the IBM core level for IBM maintenance of the CPU. Comma Corp. or Sorbus, Inc. normally maintains the memories.

The price to expand a 128K-byte CPU to 256K is $45,000. Doubling the 256K to 512K is $80,000, and 256K to 1M bytes is priced at $190,000.

The firm is at 2801 E. Oakland Park Blvd., Suite 307, 33306.

Nashua Offers Double-Density Pack For 3330-11s With Trade-In Credit

NASHUA, N.H. – Nashua Corp. is now supplying disk packs for IBM 3330-11 and similar double-density disk drives. The firm will also accept any vendor's single-density pack as credit against the purchase of the 4436DD double-density packs. Credit will depend on condition of the pack.

Priced at $920, the packs are available from the firm at 44 Franklin St., 03060.

Mass Memory Hotshots to Meet

ROSSYLYN, Va. – The increasing role storage is playing in the evolution of computer systems design and applications will be the theme of a workshop sponsored by the IEEE Computer Society Technical Committee on Mass Storage.

The workshop will be held here May 22-23. Persons who would like to either address the general sessions or participate in the discussion groups can contact G.C. Bacon, IBM, P35/025, Monterey & Cottle Roads, San Jose, Calif. 95193.

Deleavers Separate Printouts

BARRINGTON, Ill. – Four printout deleavers from Uarco, Inc. automatically separate a full box of carbon interleaved or carbonless business forms in less than two minutes.

The Model 2210 separates forms up to 112 plies, two plies at a time, and costs $645. The 2220, 2240 and 2260 separate two, four or six plies, respectively, at a time with variable speed up to 475 ft/min.

The 2220 is priced at $1,385; 2240, $1,895; and the 2260, $2395. Uarco is at W. Country Line Road, 60010.

NCR 350 Ties Century 300s Together With RSX Logic

By Vic Farmer
Of the CW Staff

DAYTON, Ohio – While the NCR 350 system has not yet been formally announced by NCR, it promises to be a machine to be reckoned with in very large real-time applications typical of the banking industry.

The NCR 350 architecture ties two or three Century 300 processors together by interlinking a common memory and common I/O devices. This interlinking, when tied to a new software operating system permits the 350 to handle a heavy volume of transactions simultaneously.

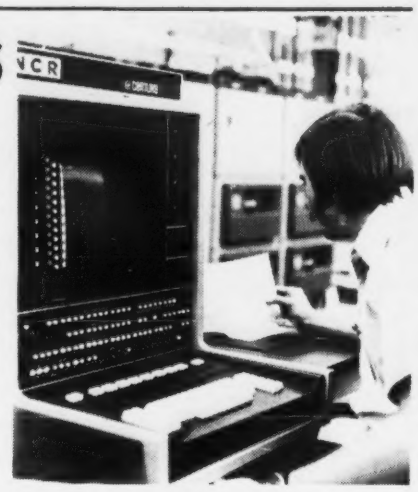
Equal Priority

In a three-CPU configuration, for example, each CPU operates with equal priority almost in a loop configuration rather than through the more common master/slave hierarchy. This provision for automatic load sharing has been achieved through the RSX operating system which is transaction-oriented and can drive the 350 configuration as well as individual Century 300 and 251 CPUs.

The RSX software includes a special version of NCR's B-4 software which provides multiprocessing and multiprogramming capabilities. RSX is available through the special systems division NCR created last year to develop large-scale on-line systems.

Three Century 350s can even be combined in an interactive system through a shared memory which will combine up to nine Century 300 CPUs. Because the 350 is still a special product, pricing information is sketchy, but indications from recent contract announcements for initial installation at the Sumitomo Bank in Japan place one 350 configuration at under $5 million.

At Sumitomo, five 350s are scheduled to replace 12 NCR 315 rod memory systems currently handling up to 160,000 on-line transactions an hour and supporting over 1,500 NCR teller terminals.



Century 350 Control Console

Two Added Buttons Give IBM 024, 026 Left Zero Fill Zap

CHICAGO – Users of IBM 024 or 026 keypunches can add Left Zero Fill to their presently installed units with a Data Replacement Service, Inc. left zero fill adapter.

Although permission for installation on IBM-owned equipment has not been approved yet, the company said several third-party lessors have approved the installation which requires two new keys to be stuck on the keyboard.

The unit is equipped with its own power supply and is shipped with complete installation instructions. Print capability can also be added to the machines at $910 to $1,300.

Priced at $650, the unit will be available in four weeks from the company at 5642 W. Diversey Ave., 60639.

Stripe Cards Cost 18 Cents

NEW YORK – Digital Automatic Tape Associates, Inc. has 1-1/4 in. magnetic stripe cards at 18 cents each in quantities of 10,000 or more. The firm is located at 376 Broome St., 10013.

Lion's Share of Printing Goes To Xerox at IBM Installation

LOS ANGELES – There's got to be a reason to remove 60% of your printing output from IBM's 3211 printer – and Atlantic Richfield Co. (Arco) has the reason at its Western Data Processing Center here.

Arco saves $2,500/mo in paper costs and cuts time delays by using two off-line Xerox 1200 printers fed by tape generated on an IBM 370/158.

Volume generated on the printers was more than a million pages last month and that's not the only output, according to Don Raney, manager of computer service at the center. Raney still uses his 3211 printer for about 30% of his output and a Datagraphics Micromation computer output microfilmer for the remaining 10%.

The 1200 prints xerographically by an optical imaging technique on ordinary unsensitized 8-1/2 in. by 11 in. paper at up to 4,000 line/min. The smaller paper format is what saves Arco about $2,500/mo in paper costs compared with the cost of the 14-7/8 in. by 11 in. forms used on the 3211.

Because more than half of the center's reports are mailed to Arco facilities throughout the nation, there is also a considerable savings in mailing costs with the smaller, lighter output of the 1200.

The largest single job put out by the center is Arco's marketing uniform sales report, a detailed monthly report on sales of gasoline and other Arco products. Various sections of this report are distributed throughout all levels of the company, from top management to service station dealers in the field, and its total volume can run as high as 300,000 pages.

"Before we installed the new printer," said Bob Hurr, general supervisor for data input/output at the center, "the uniform sales report after being run on the impact printer would have to be decollated and sometimes burst and bound.

"Many of our users – especially the top company managers – wanted to have the 14-7/8 in. by 11 in. computer forms reduced to a standard page size. About 100,000 pages a month were being reduced in our duplicating department alone, and I'm sure that many more pages were condensed in other parts of the company," he explained.

The net effect of all this was to delay delivery of the report to the manager's desk for several days after it had been printed. "Now," said Hurr, "we can distribute these reports as soon as they come off the machine. Normally the report, as it comes off the 1200, is already broken down by cost center or sales area or sales code – so we can take each section of the report as it is printed, slip it into an envelope and put it in the mail.

"This way, we don't have a volume of reports stacked up on us all at once – we're just constantly feeding the mail room. Now if we start a report in the morning, a couple of copies can be in the mail before the end of the day," which was not practical previously, he added.

Kit Cuts Processing Time On Univac 1050 by 25%

METUCHEN, N.J. – The Q1050A conversion kit from Quality Computer Services can cut process instruction time by 25% on the Univac 1050, according to the firm.

The conversion decreases the average instruction execution time from 100 μsec to 76 μsec, and allows the processor to cycle memory equivalent to a rate of 3.4 μsec compared with the standard rate of 4.5 μsec, the firm said.

Maximum channel speed is raised to 294K char./sec from 222K char./sec.

Priced at $1,500 for nonbuffered processors and $1,950 for buffered processors, installation is included anywhere in the U.S.

The conversion is transparent to all software programs and a switch allows disconnection for maintenance. The firm can be reached through Box 791, 08840.

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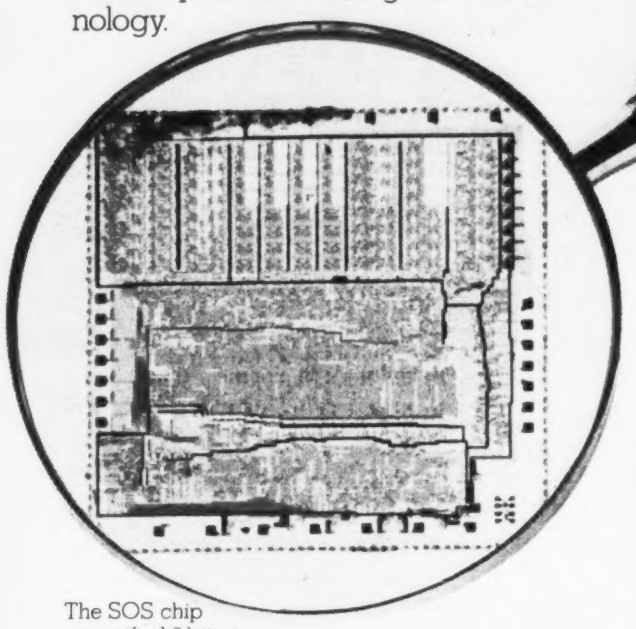

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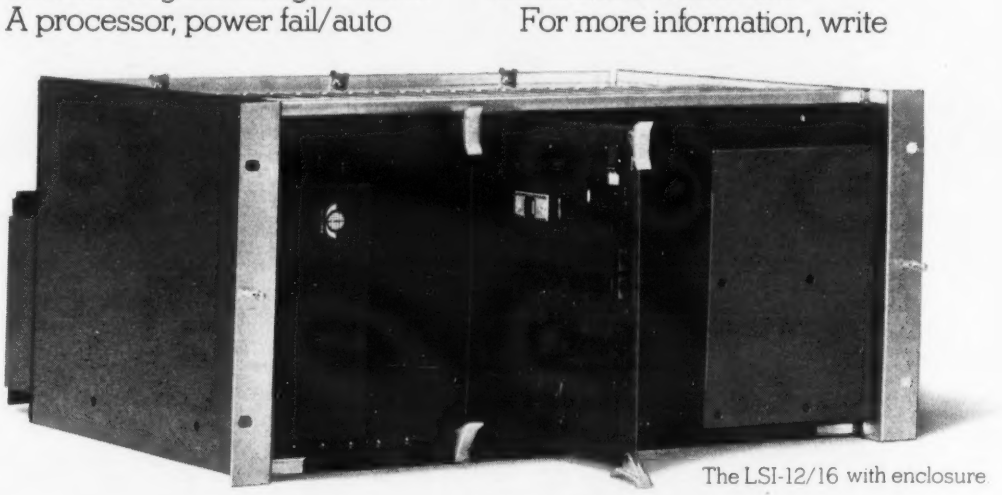

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Varian Groups Minis, Peripherals Into 5 Standard Configurations

IRVINE, Calif. – Varian has packaged its minicomputers and peripherals into five standard configurations "most frequently specified by users in 57 major industries." These packaged systems provide users with three main benefits: a 5% to 10% price break, faster delivery and easier upgrade options, according to the company.

The basic batch system consists of a 32K-byte V72 mini with disk, paper tape reader, line printer, console, priority interrupt, buffer interface controller, I/O expansion chassis, cabinet and Master Operating System for batch Fortran processing. The system costs $36,300.

The "big batch" system, at $61,500, adds 16K more core memory, 9-track tape drive, faster line printer, dual buffer interface controller, card reader and comes in a twin cabinet.

For interactive use, the 72/Eleven package uses a 48K V72 mini, 2.34M word cartridge disk, teleprinter and card reader with two priority interrupts, twin buffer interface controllers, I/O expander and Vortex telecommunications operating system. Fortran IV, Basic and RPG IV capabilities are included for a total price of $43,250.

The 73/Twenty time-sharing system uses a 64K V73 mini, cartridge disk, card reader, line printer, 9-track tape drive, twin priority interrupts, twin interface controllers, teleprinter, I/O expander and Vortex operating system. It is priced at $75,000.

The 74/Fifty, priced at $115,500, uses a 128K V74 mini, writable control store, Fortran accelerator, card reader, paper tape reader/punch, CRT console, 9-track tape drive, line printer, 29M-byte disk drive and Memory Map, which allows main memory expansion to 256K words. This system utilizes the Vortex II operating system.

Delivery of the smaller systems is in 30 days with slightly longer quotes on the larger systems from 2722 Michelson Drive, 92664.

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MSI Version of PDP-8 Has 3 Memory Options

MAYNARD, Mass. – DEC has added a lower cost MSI version to the PDP-8 series, the PDP-8/A, priced at $895.

The 12-bit PDP-8/A is a two module configuration consisting of a 15 in. by 9 in. CPU module with addressing capability up to 32K.

The system has a basic cycle time of 1.5 μsec and three memory options including random access read/write, read only or programmable read only.

The 8/A is compatible with existing PDP 8s and handles all existing PDP-8 programs including OS/8, Caps-8 and TSS-8 operating systems, plus Basic, Fortran IV and Focal languages.

Sixty peripheral options are available.

DEC has also added an 8-bit microprocessor series, the MPS, at $745 but all programming for the unit must be performed on a 4K PDP-8 in Microprocessor Language.

Datum Turnkey T/S System Based on Nova, 524K Drum

ANAHEIM, Calif. – Based on a Data General Nova minicomputer, a 524K drum for memory swapping and sixteen multispeed ports, Datum, Inc. is offering a Basic-oriented turnkey time-sharing system for $25,000.

Peripherals offered include CRT terminals, teletypewriters, 9-channel 800- or 1,600 bit/in. tape, paper tape reader/punch, 600 line/min printer and 165 char./sec printer.

The system can be expanded to a 1M-byte fixed-head drum, 19.2M-byte cartridge disk drive, or up to 200M bytes of removable disk pack storage.

The system features Basic language with many extensions, selectable calculation precision – 14, 10 or six decimal digits – and automatic power-fail-auto-restart. Capabilities include access to an unlimited number of random or contiguous data files, alphanumeric string manipulation, matrix operations, assembly language subroutine calls and program chaining and merging, according to the firm.

The Timeshare System 70 is intended for commercial DP and polling front-end applications, and is available from the firm at 1363 S. State College Blvd., 92806.

Unit Makes 700 Fiche Copy/Hour

RIDGEFIELD, Conn. – Automatically copying microfiche at 700 duplicates per hour, the $7,900 3070D from Dimax Systems, Inc. uses 1,000-ft rolls of Diazo copy film. The firm can be reached through Box 442, 06877.

Accept Social Responsibility

DPers Shouldn't 'Just Follow Orders'

TORONTO, Ont. – Although some DP people are willing to "just follow orders," the true DP professional will proceed like an engineer building a bridge, Dr. Harvey S. Gellman, president of DCF Systems Ltd., told a Life Office Management Association forum here.

Speaking on "The Social Responsibility of Data Processing Personnel," Gellman stressed that DP people build their own bridges that carry people, "and we don't want them to crash."

DP people must have enough professional integrity not to do "anything that will harm humanity, because . . . misuse of computers will also hurt us," he stated.

In 1972, he said, the French newspaper *Le Monde* published results of a questionnaire showing that 78% of the respondents believed computers constituted a threat to individual liberties.

While society must balance its need for information required in law enforcement and public and private decision-making against the individual's right to privacy, Gellman observed, "We need good laws to ensure that the strong do not oppress the weak."

"None of the existing laws is strong enough," he stated.

DP people, either individually or through their organizations, can prod and help legislators develop such laws. They have a special responsibility, he said, because they are in a good position to know how a system can be safeguarded against hurting people.

And because of their close contact with computer systems, DP people "are in a position to foresee the effects of computers and therefore they owe it to society to be responsibile forecasters," Gellman stated.

But the particular responsibility of DP staffers, Gellman continued, is "to ensure that the systems they work on are well-built."

It takes competent personnel to produce computer systems that help rather than hurt people, he said. And, given a choice, excellent, rather than merely competent DP people would be better for the task, he said.

And to be excellent, Gellman said, a person must have talent for the work he's doing, he must enjoy what he's doing, and perhaps most important, he must be a fanatic about it "with excessive enthusiasm."

Loving Care Keeps System in Shape

TORONTO, Ont. – A simple way to determine the security of your computer system is to check it against these security "musts" concerning equipment care.

- **Review statistical records of equipment utilization, job accounting and on-line activity, such as input and output volumes, processing and turnaround times, in order to anticipate overloading and to ensure acceptable operating performance.**
- **Consider monitoring computer usage by a separate console in a secure area.**
- **Run periodic tests on equipment to spot malfunctions; for example, before critical jobs are run.**
- **Follow the manufacturer's recommended environmental specifications and schedule of preventive maintenance for the equipment.**
- **Clean or change air conditioning filters periodically as specified by the manufacturer. Use Underwriter Laboratories Class 1 filters.**
- **Clean magnetic tapes and drives periodically as specified by the manufacturer. Use a nonflammable solvent.**
- **Note defective areas on tapes and disks encountered during computer operations; keep a log of such defects and use a tape tester periodically to identify defects on tape.**
- **Record each end-of-job on the console log along with the operator's comments as to successful completion or any unusual event which occurred.**
- **Record all hardware and software "crashes," stating the reason, the time, the remedial action, whether a core dump was taken and who made the entry.**
- **Retain the console log sheets for at least one year.**
- **Instruct the senior shift supervisor to review the console log sheets daily to detect improper operating procedures, suspicious reruns or unauthorized runs.**

This checklist was compiled by DCF Systems Ltd., 74 Victoria St., Toronto, Ont. M5C 2A5.

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RCA

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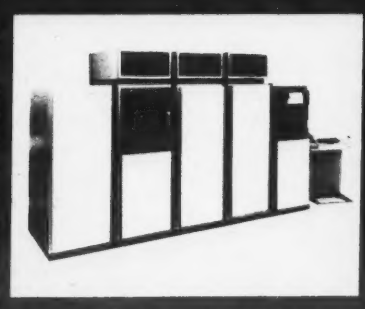

Big names in business like Fruehauf Corporation and Banc-Systems Association are using Action's TELECONTROLLER* programmable communications processor to up their 360's and save from $1,000 to $10,000 per month.

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At BASF, we go the extra distance to give you tape with no surprises. Take for example the special "clean room" environment in which our tapes are manufactured. It's just one of the ways we guard against surface debris, which could cause drop-out errors.

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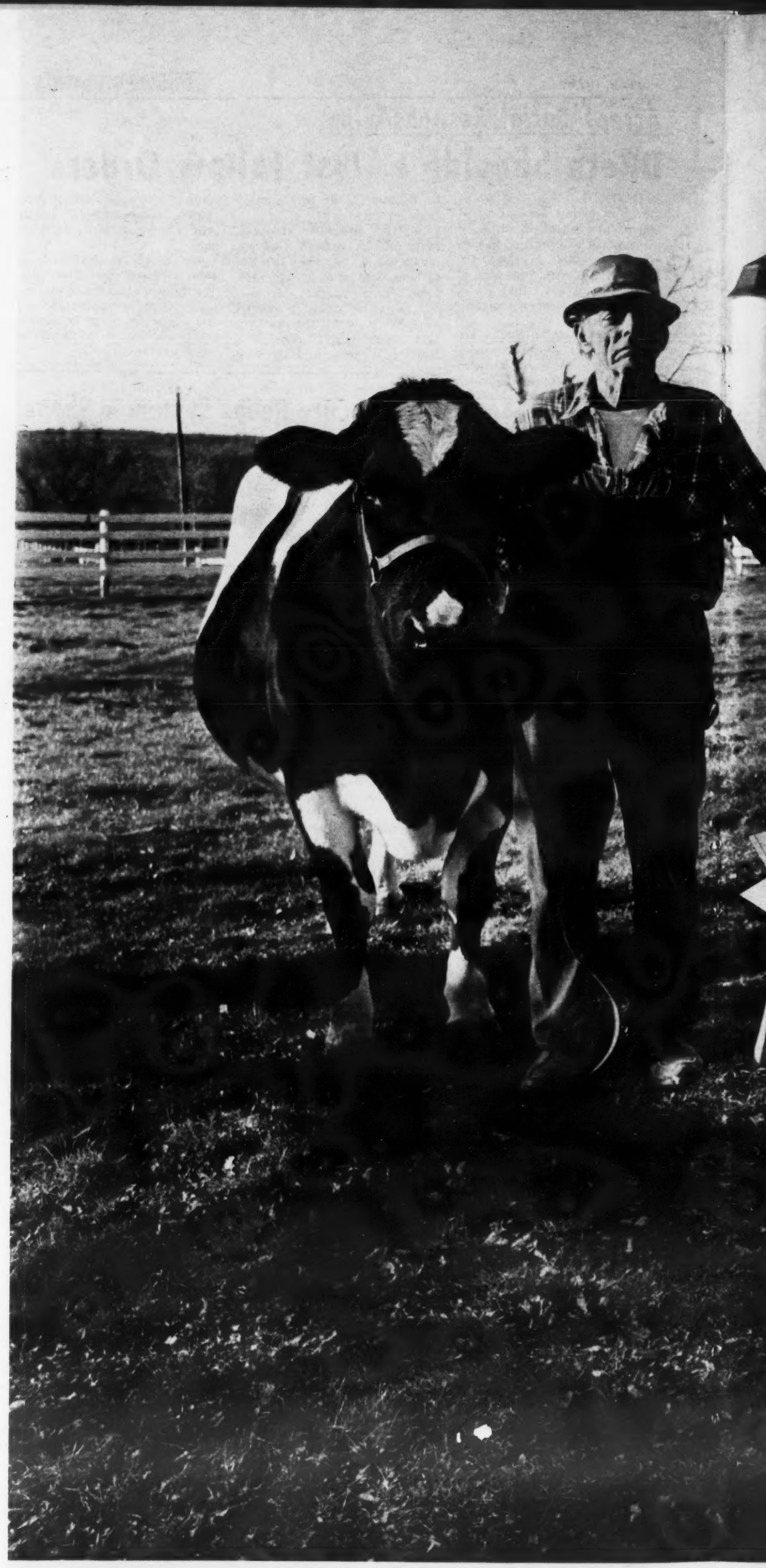
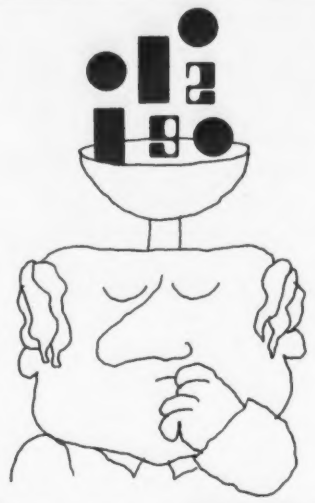


When it's BASF...you know it's n

not the tape that goofed.



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IMPORTANT ADDRESS CORRECTION FOR CHARLOTTE

We goofed. There's no other way to say it. Our Caravan brochure ond other literature has an incorrect address for the location of our 1974 Computer Caravan in Charlotte. Please note the correct location below. **Both the User Forums and The Exposition will be held at this address.**

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April 23-25

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Festival of Computer-Generated Films

Hollywood Never Had Such Scripts

By Robert L. Glass
Special to Computerworld

OLYMPIA, Wash. – "A computer-produced picture is worth 10,000 words."

That updated truism was the basis for the First Annual International Computer Film Festival held recently at the Evergreen State College here.

Five internationally known specialists in the rapidly emerging field of computer filmmaking formed the focus of the festival: Dr. Kenneth Knowlton, computing techniques research department, Bell Telephone Laboratories; William Fetter, head of the Computer Graphics Lab and chairman of the department of design, Southern Illinois University; Lillian Schwartz, artist-in-residence, Bell Telephone Laboratories; John Whitney Sr., Department of Art, UCLA; and Ronald Resch, computer science department, University of Utah.

Response to the festival from the technical/artistic world of professionals was satisfying, festival organizers said, with 60 people attending the early presentations and discussions.

But response from the general public, largely Evergreen students at this off-the-beaten-path campus, was astounding, they indicated. About 400 people tried to crowd into a 300-seat lecture/theater hall where evening showings of computer art films were being held; another theater was quickly opened to give redundant showings to the overflow.

Daytimes at the three-day festival were devoted to presentations by the invited speakers. Whitney likened the state of the art in computer filmmaking to dropping a piano into the midst of a tribe of uneducated people – whether they chopped up the unfamiliar object for firewood or used it as a tool to produce music would be totally unpredictable.

In the evenings, showings of computer-produced films were open to the general public.

The first evening was devoted to educational films, from "Art From Computers" to "Cause of Ice Ages – A Hypothesis."

DP and the Arts

The second night consisted of artistic films, a kaleidoscopic dazzle of moving, rotating and undulating computer graphics, sometimes shown to the beat of computer-produced music.

The third evening was for technical/scientific films – "Quantum Mechanical Wave Functions of the Hydrogen Atom," "SST Cockpit Visibility," and "Engine Removal."

The festival defined a computer film to be one which contains footage animated, generated or containing graphic material manipulated by a computer. Techniques for doing this ranged from coupling a camera with automated shutter to a display device which received frames of graphic stills from a computer, to use of a movie camera to film motion displayed on a computer-linked CRT.

The films were unjudged, unlike those at other film festivals. However, a nonprofit film tour is being arranged, and some of the films will be available for viewing at universities, research centers, art museums and special events across the country.

Computer filmmaking is a uniquely interdisciplinary field, according to Richard Speer, one of the directors of the festival and a member of the staff of the Evergreen State computer center. He pointed to the credentials of the invited speakers as an example.

The college, he felt, was an ideal place to hold such a festival because the school is non-departmental, with all studies conducted in an interdisciplinary fashion.

Speer said computer filmmaking is already impacting the broader world in various ways. Children's TV shows, such as Sesame Street and the Electric Company, are using computer-produced title sequences. And traditional movie makers are beginning to consider the computer's role – such trade journals as *Filmmaker's Newsletter* have carried articles on computerized films.

If there was one conclusion to be drawn from the festival, said the speakers, it was that computerized filmmaking is more than a sound and light show; it is a producer of abstractions which cannot be produced any other way, and that may be its most important future.

The festival was sponsored by the Computer Arts Society of the U.S., the Washington State Arts Commission (a branch of the National Endowment for the Arts) and Evergreen's Department of Computer Services.

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X-ray Machine Probes Brain's Depths

NEW YORK – A computer-controlled X-ray machine able to probe nooks of the brain previously unexplored by the medical world is "the most revolutionary breakthrough in X-ray technology in 50 years," according to Dr. John Evans, chief radiologist for the New York Hospital-Cornell Medical Center.

The machine, called an EMI-Scanner after the British firm EMI Ltd., is used to diagnose strokes, effects of "hardened arteries," hemorrhages, tumors and birth defects.

Distinguished Densities

Its clinical worth, explained Evans, lies in its ability to differentiate brain tissue densities 100 times better than the conventional X-ray. Each particle of the brain absorbs a different amount of X-ray. Each particle of the brain absorbs a different amount of X-ray radiation when bombarded, and the X-ray machine is designed to perceive these differences and distinguish the individual tissues graphically.

But ordinary X-ray machines, he continued, only have the capability to pick up "major" differences, whereas the sensitivity of the EMI-Scanner allows "minute" differences to be readily detected.

The diagnostic test, which costs less than an ordinary brain X-ray because it requires no hospitalization, takes only four minutes and is painless, Evans said. The patient merely lies on an examining table connected to the scanner and sticks his head into the machine, which resembles a front-loading washing machine.

Double Data

After 160 X-ray readings are taken, the information is processed by a Data General Nova 820 and is released in two forms. The first is a printout which shows tissue densities through a pattern of numbers, and the second is via pictures shown on a CRT screen where they are photographed for the permanent record.

Evans explained that by comparing pictures taken at different levels of the brain, it is possible, for example, to determine the precise depth of a tumor. With the conventional X-ray, the different levels of the brain are all superimposed in one picture. He also points out that the ordinary X-ray cannot show the slices of the brain in cross-section.

EMI said 50 hospitals around the world have placed orders for the system.

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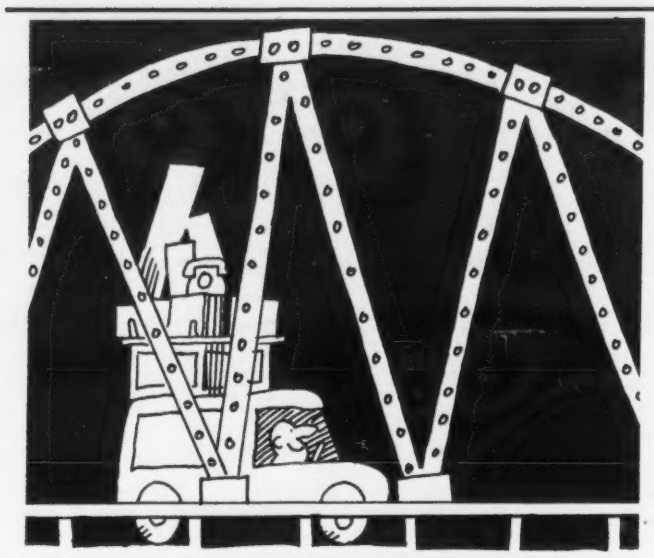

Our New York Office has just crossed a bridge.

Don Fagan and Frank Gallo, *Computerworld's* intrepid Eastern Regional salesmen, have pitched a new office. They can now be found overlooking the toll booths of the George Washington Bridge in Fort Lee, New Jersey – just 20 minutes from downtown Manhattan. Their new address is below and they'd be glad to hear from you any time.

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Frank Gallo – *Account Manager*
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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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On-Line Order Processing System Opens Whole New World of Speed for Drug Firm

By Vincent E. Gallagher
Special to Computerworld

NORWICH, N.Y. – A new teleprocessing system at Norwich Pharmacal puts the company's five distribution centers across the country as close as a keyboard to central headquarters. Sales, distribution and invoicing are handled "on location," communicating constantly with centralized inventory, accounts receivable and credit files. Major files are linked; on-line processing keeps the pharmaceutical firm always up to date.

The remote on-line order-processing system, in operation since March 1973, uses two IBM 3270 visual display terminals and a printer at each distribution center, linked to a System 370/145 at headquarters in Norwich.

As orders are received, operators at the distribution centers enter them through the keyboard terminals and inquire into headquarters files on inventory status, customer credit ratings and other customer data.

Responses appear on the local terminal screen. Problems, if any, are flagged in headquarters. Finally, assuming the order can go through, the complete order document is flashed on the screen at the distribution center for the operator's inspection. Once approved, it is printed out, along with shipping papers, on the printer next to the terminal. From there it goes directly to the warehouse for packing.

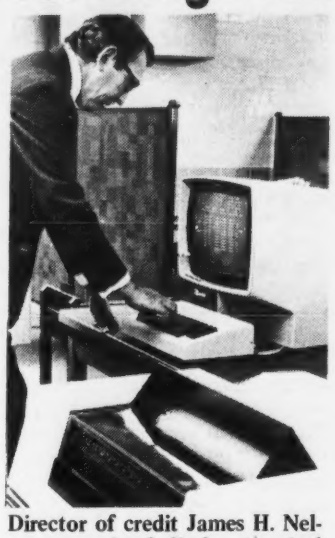
Previous to the on-line order processing/cash application, we used units at the distribution centers that punched paper tape while producing non-detailed shipping orders. The taped data was transmitted to Norwich and fed into the computer to update records, produce invoices, etc. This was slow, needed a good deal of manual work and produced delayed inventory information and invoicing.

We can now pull, pack and ship each order much faster than before. All bill-of-lading and delivery information is in the shipping papers, so the men at the warehouse need only enter data in the correct boxes on the bill-of-lading. And the invoices, which used to be prepared and mailed in Norwich, are now ready and can either go directly with the shipment or directly into the mail.

The ability to inquire into inventory status, including location of inventory, has an important side benefit.

Under certain circumstances, one distribution center can have merchandise shipped from the stock of another, thus speeding customer service, reducing back orders and making the most efficient use of our entire inventory.

When a major chain sends us a large order, we can determine which items can be shipped most efficiently from which location. We then key this data into a terminal and the computer will distribute the order automatically to the various centers, where the papers are printed and items shipped.



Director of credit James H. Nelson uses visual display terminal to check customer's credit history. Printer in foreground flags credit department whenever an order entered via a terminal at any of Norwich's distribution centers needs a credit check.

If an order should be flagged for credit reasons, a printout in the credit department gives the name of the customer, distribution point where the order was entered, and a code indicating a past due bill, a credit limit overage or an account that requires special handling.

This printed information goes to the credit director or one of his six credit managers. Based on a detailed display of the customer's account, which they call

(Continued on Page 34)

(Advertisement) *(Advertisement)*

Learn What You Need to Know About Contracting for Computers and EDP Support Services-In One Hard Lesson

A two-and-a-half-day seminar that can help you protect your EDP investment – and your system.

The response to our first ad on this seminar was excellent, and we've decided to go ahead with three seminars in the first part of 1974. Conducted by Roy N. Freed, the well-known expert in computer-related law, this unique seminar can give you the information you need to get good, effective contracts from the vendors that supply your EDP installation. And in an industry that's famous for its "promise them anything" attitude, this information can be invaluable. It can save you money. It can save you time. And, most important of all, it can help you protect your installation from disruptive discontinuities.

Here are some of the subjects covered in the seminar:

- The lease or purchase of computer systems.
- The lease or purchase of separate hardware or software.
- The purchase of time-sharing, data processing services and consultation.
- The use of facilities management.

And here are some of the things you'll learn:

- How to recognize opportunities to negotiate.
- How to establish goals and state conditions – before it's too late.
- How to place yourself in a strong bargaining position.
- How to insure on-time delivery of exactly what you've bargained for.
- How to reach an agreement that protects the security of confidential data.
- How to set reasonable performance standards for warranties.
- How to provide tax savings through proper wording of contracts.

Free Resource Notebook

You'll also receive a valuable reference notebook which will back up the information you'll receive at this meeting. *The notebook will include sample vendor contract forms.*

Roy N. Freed, a leader in this field.

Roy Freed has specialized in computer-related legal matters for many years. He has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in **private practice with a prominent Boston law firm.**

He has authored many articles on the various legal aspects of computers – including "Computer Frauds – A Management Trap" *(Business Horizons)* **and a book entitled "Computers and Law – A Reference Work." Mr. Freed will personally conduct the entire seminar.**

Should you attend this seminar?

If your're involved in the purchase of EDP equipment or services, the answer is a resounding "yes." Whether you're a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm, this seminar will pay for itself many times over. You just have to read the pages of *Computerworld* to realize how frequent supplier problems are – and how costly and disruptive they can be. This seminar can help you get what you want when you want it. It will help your company, your industry and you!

Times, places and cost

There is still one more seminar scheduled this spring.

May 22-24–St. Francis San Francisco

Total cost for the entire seminar, including the complete resource notebook, continental breakfasts, lunches and coffee breaks, is $295.00. Hotel rooms, if required, are not included.

Note: Enrollment must be strictly limited, and our other seminars were sold out. So don't wait until it's too late to enroll.

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D.C. ACM Group Sets Up Spring Seminar Series

WASHINGTON, D.C. – The Washington, D.C. chapter of the Association for Computing Machinery (ACM) is conducting spring seminars on such topics as peripherals and CRTs, minicomputers, graphics and Cobol optimization.

The orientation of this series is not managerial and not super-

Societies/ User Groups

computer oriented, according to a chapter spokesman. "In fact," he said, "the evening sessions on programming are PDP-oriented while the graphics will be intelligent terminal-oriented."

The evening series, featuring "Putting Peripherals in Perspective," "Introduction to CRTs" and "Programming Word-Oriented Computers . . . Minis," begins May 28.

The day series begins June 3 and includes "Cobol Optimization," "Programming Graphics," "Interfacing Minis to Maxis" and "Computer Systems Models."

Further information is available from Paul D. Lane, Lane & Associates, Ltd., 6110 Executive Blvd., Rockville, Md. 20852.

World Papers Invited For Aussie Conference

Special to Computerworld

SYDNEY, Australia – The Sixth Australian Computer Conference will be held here May 20-24. Sponsored by the Australian Computer Society, it is international in scope and papers are invited from all countries.

Further details of procedure for submission of papers are available from: Chairman, Papers Subcommittee, Sydney, Sixth Australian Computer Conference, P.O. Box 250; Grosvenor St., New South Wales, 2000, Australia.

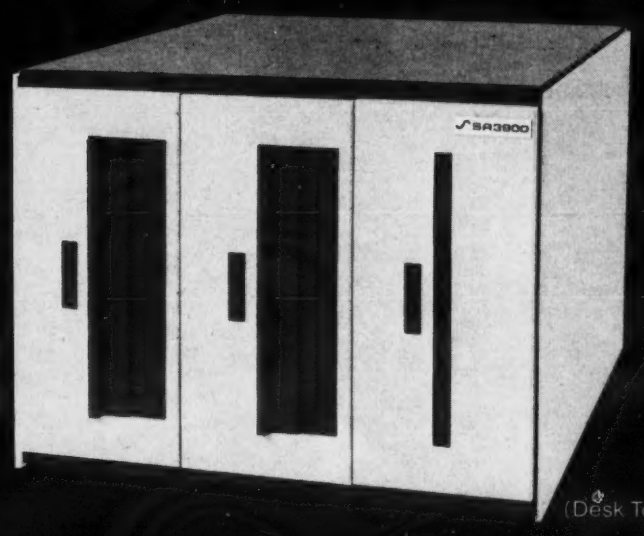
Society Sundries

William J. Letendre of the Air Force's Electronic Systems Division has been elected chairman of the Computer Performance Evaluation Users Group.

– – –

Harold T. Redding, Dun & Bradstreet, Inc., has been elected to the board of directors of the Information Industry Association (IIA) following the resignation of Dr. Alice Curran.

Great... with your system



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- Application flexibility, economics, and reliability compared to other methods of low cost storage.

To receive additional information about the SA3900 and why it is GREAT WITH YOUR SYSTEM, contact our Marketing Department in Sunnyvale, California, or meet us when the Computer Caravan tours your area; we'll be on it. We will also exhibit at the N.C.C.—booth 1024/26.

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Terminal System Opens Up New World

(Continued from Page 32)

out on a nearby terminal, they then decide whether the order should be shipped or held.

Outline cash application is an important part of our new system, and contributes significantly to making the on-line credit check meaningful.

Virtually all cash payments now appear in the records on the same day we receive invoice stubs or check copies from the banks.

What few payments carry over in the evening are all entered before the morning mail arrives at 9. With our previous batch-type system, there was at least a three-day delay after cash was applied before it showed up on our records. The result was customer complaints. Once a customer mails a check, he considers the bill paid; he doesn't appreciate being dunned or having his orders delayed because his supplier's records are not timely.

In cash application, banks now just send us the invoice stubs with the amount paid circled; if the check is made out for a different dollar amount, the bank sends a copy of the check. We receive the check itself only if it is erroneously made out – possibly unsigned, or with the two dollar amounts on the check not in agreement.

The invoice stub gives the terminal operator all necessary information – customer number, invoice number and dollar amount. The system is built around the customer number, which the operator keys into the terminal first, followed by the dollar amount. The computer then displays all of the customer's unpaid invoices and applies the check to them, beginning with the oldest items, until it runs out of money. If the system can satisfy a combination of oldest invoices, the operator presses a button and finalizes the transaction.

75% of the Time

If this isn't possible, the computer displays the total check amount as unapplied and the operator performs the distribution via the terminal keyboard. However, the computer can handle the whole job about 75% of the time.

The system automatically balances against deposit controls. Before processing begins, the operator keys in the control deposit amount from the bank tape. As customer payments are applied, the computer accumulates the amounts and, at the end of the deposit, displays the total applied, the original control total and any variations. Thus, we can spot immediately if the bank neglects to send a check listed in the control tape or if a check was entered incorrectly.

Vincent E. Gallagher is director of distribution services, Norwich Pharmacal Division, Morton-Norwich Products, Inc., Norwich, N.Y.

$9225 buys this complete high-performance computer system from Texas Instruments

Combine a *Silent 700** Model 733 twin-cassette ASR data terminal and a 980A minicomputer with 8K of memory. You have a fast, powerful computer system, including a cassette operating system, for much less than you would normally expect to pay.

And delivery is only 30 days.

This system is useful for such applications as business data processing and batch data retrieval. Add more *Silent 700* terminals and do multiple terminal data entry. Or run multi-user BASIC. With 16K of memory, run high-level languages like FORTRAN IV.

By adding a disc, you can run the powerful DX980 operating system. This way, for less than $25,000, you get a system that is substantially equivalent to other systems with price tags of $35,000 or more.

With *Silent 700* ASR terminals, you get the speed, quietness and reliability that have made them a standard of comparison. And, the convenience of tape cassettes and non-impact printing make the *Silent 700* terminals a powerful alternative to conventional paper-tape teletypewriters.

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TEXAS INSTRUMENTS
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ICCP Gets CDP Control

NEW YORK – The Data Processing Management Association has officially turned over the administration of the Certificate in Data Processing to the Institute for Certification of Computer Professionals.

In addition to relinquishing its control over the CDP program, which was started in 1961, DPMA also gave the ICCP control over the administration of the Registered Business Programmer Examination, which was founded in 1970.

First Time

"For the first time since the introduction of the computer, there is an organization established for the sole purpose of evaluating, developing and promulgating professional certification programs in the information processing industry," noted John K. Swearingen, president of ICCP.

The DPMA Certification Council will continue under the agreement under ICCP instead of DPMA, however, and the ICCP has signed a contract retaining DPMA to provide management and clerical service for the conduct of the two certification programs.

ICCP will continue to accord full certification recognition to the almost 14,000 persons who have completed the exams under DPMA auspices.

In Value Conflict

Privacy Often Takes Back Seat

WASHINGTON, D.C. – Although there is a growing philosophical concern in the country over individual privacy vis-a-vis computer data banks, most Americans "would rather give up some or much privacy" in order to gain economic or other benefits.

Most people support the idea of privacy, according to Arthur S. Miller, a professor at the George Washington University National Law Center, especially as an abstract concept.

However, when privacy "conflicts with other values, chiefly economic well-being, then it likely will give way.

"If people have to make choices, probably most Americans would rather give up some or much privacy in order to gain what to them is the greater goal," the professor said in a recent article in "The Privacy Report," published by the American Civil Liberties Union's Project on Privacy and Data Collection here.

Not Self-Evident

"For that matter, it is by no means a self-evident proposition that people, beset

"Privacy only gets recognition and attention when the right to privacy does not conflict with the interests of the nation . . . "

by the loneliness of living on a dying cinder in the midst of limitless space, prefer privacy over, say, the solace to be gained from the warmth of human associations.

"The tendency of Americans to form groups . . . is testimony to a pervasive wish not to be alone," he noted.

Man, the professor continued, "is conformist, rather than individualist as the American myth would have it," and therefore would rather give up his privacy than be alone.

While Americans have been increasingly giving legal recognition to the right to privacy, at the same time there "has developed a technological ability to invade it by a number of means heretofore not known," he noted.

Privacy only gets recognition and attention when the right to privacy does not conflict with the interests of the nation or when the concept can help further those interests, he pointed out.

Overall, he said, the concept of privacy "tends to be a value of the middle or upper classes in the U.S., which is honored when it does not unduly intrude upon the prerogatives of the state. By no means is it an ultimate value. The desire for companionship, the fear of loneliness, far outweigh individual interests in privacy."

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- 2319 – Single Density High Speed Systems for all System 360's
- 2314 – for all System 360's

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- 3420 – High Speed Drives for all System 360's, 370's
- 2401 – Models for all System 360's

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- Model 40 – 128K to 512K
- Model 50 – 256K to 2000K
- Model 65, 67, 75 – 256K to 4000K

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Nationwide Statistics

Fatality File to Give Road Death Clues

By Edie Holmes
Of the CW Staff

WASHINGTON, D.C. – Federal officials hope to cut the death toll on the nation's highways by constructing a large-scale data base on fatal traffic accidents from around the country.

The year-old project, known as the Fatality File, is under the direction of the National Highway Traffic Safety Administration (NHTSA), an agency within the U.S. Department of Transportation.

Designed to accumulate case record information on every fatal motor vehicle accident in the country, the files will give NHTSA the data base needed to create a nationwide picture of the hows and whys of highway deaths.

State Analysts

Under this system, every police report on a fatal accident is forwarded to state analysts who complete an NHTSA form consisting of 150 items. Drawn from state bureaus of vital statistics and motor vehicle department records, the information requested by NHTSA requires no additional research effort from the states.

The state analysts answer questions dealing with the location of the accident, time, weather conditions, traffic situation, make and model of vehicle, condition of tires, estimate of damage, who or what caused the accident, highway design and a history of the vehicle and driver.

From the states, the data goes to Washington where it is fed into an IBM 360/65. NHTSA does not own the computer, but depends on a time-sharing contract with a private firm to process accident data.

Exploratory Phase

"We're still in the exploratory phase of analyzing data," commented a Department of Transportation official. "While we've responded to a few ad hoc queries in order to test the file's organization," he said, "we need to complete the data base before our mathematical analysis division can provide statistical information to the program people in NHTSA."

Eventually, NHTSA hopes states will be able to request combinations of data currently beyond their compiling capabilities. State officials, for example, could ask for and receive data on the age of drivers involved in accidents with a particular make and model car. Or, they might want to know how many of the traffic fatalities had previous arrests for driving while intoxicated.

"Everyone thinks traffic enforcement officials know everything about people who die in highway accidents," said a project officer with the Fatality File. "Before, we got all sorts of confusing and conflicting statistics from the states. Now, with the assistance of the computer, we hope to build the large-scale data base needed to understand the nature of traffic accidents."

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COMPUTER INDUSTRY

CI Notes

World Trade Restructured

ARMONK, N.Y. – IBM has restructured its World Trade business into two new operating units reporting to the Corporate Office through IBM Vice-Chairman Gilbert E. Jones.

The first new unit is IBM World Trade Europe/Middle East/Africa Corp., with Jacques Maisonrouge, IBM senior vice-president, as chairman and chief executive officer, and Frank J. Cummiskey as president.

The IBM World Trade Americas/Far East Corp., will be headed by Ralph A. Pfeiffer Jr. as chairman and chief executive officer. Pfeiffer, who has been elected an IBM senior vice-president, was formerly president of the Data Processing Division, a slot now taken by John F. Akers, formerly vice-president for field operations. The president of the new unit is Gordon R. Williamson, formerly WTC vice-president and group executive for the Americas/Far East.

CIA Team Adds Ream

LOS ANGELES – In a step toward fulfilling a promise to work toward a national program for the development of computer standards, the Computer Industry Association has appointed Norman Ream to head its program.

Ream was director in 1965 of the Institute for Computer Sciences and Technology, part of the National Bureau of Standards, and later was responsible for establishing the Navy's Automatic Data Processing Equipment Selection Office.

Ream will be the association's principal delegate to the X-3 Committee, CIA's executive director Jack Biddle said.

Nine Presidents Visit Moscow

LOS ANGELES – Presidents of nine member firms of the Western Electronics Manufacturers Association have gone to Moscow to discuss Soviet trade opportunities. The trip is part of an overall plan to expand the association's activities in the international field. Among those in Moscow were Harold Frank, Applied Magnetics Corp.; Trude Taylor, Electronic Memories & Magnetics Corp.; Robert Noyce, Intel Corp.; Jesse Aweida, Storage Technology Corp.; and Earl Wantland, Tektronix, Inc.

Supershorts

Interdata, Inc. shipped its first 7/16 mini on schedule to American Business Systems in Los Angeles.

– – –

Entrex, Inc. shipped its 500th System 480. More than 5,000 Data/Scope keystations have been installed.

– – –

Scientific Measurement Systems, Inc. has received a patent on its Series 100 Tape Display System.

Industry Figures Endorse Measure

Bill Expands GSA Multiyear Lease Use

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – Industry association leaders have endorsed a bill that could allow the General Services Administration to effect a savings of up to $75 million over a two-year period by conversion of present short-term leases to five-year leases.

The bill, introduced by Sen. Charles H. Percy (R-Ill.), permits the GSA to expand the use of multiyear leases through its automatic data processing fund.

Under present law, the GSA is permitted to use multiyear leases, but at the time of contracting must obligate the amount payable over the entire period.

"Because the fund cannot support such large outlays, GSA must normally enter into short-term (one-year) leases, or long-term leases with termination rights. Neither of these methods is as economical as firm-term multiyear leases," Percy said in testimony on S2785 before the Senate Ad Hoc Subcommittee on Federal Procurement.

Michael Creedon, president of the Computer Lessors Association, said: "We applaud the GSA in this effort to provide for multiyear leasing. We welcome what we perceive to be a new and growing trend in the GSA to encourage smaller companies such as the members of the Computer Lessors Association and other segments of our industry to do business with the Federal Government."

Creedon added that small companies as well as the government and taxpayers have suffered from an industry dominated by a few massive corporations. "The small company has been virtually the only viable economic alternative source of computer equipment and services to the government."

CBema Amendments

Peter F. McCloskey of the Computer and Business Equipment Manufacturers Association endorsed the bill, but suggested some amendments that would broaden its scope.

One change would allow multiyear contracting authority to the user agency in addition to GSA's revolving fund.

"When agency multiyear leasing is justified, the option should be available," McCloskey said.

The language of the bill should be modified to cover "collateral maintenance, software and other kinds of services that normally flow with equipment acquisition," he said.

In addition, McCloskey noted, in order for long-term contracts to offer savings to the user, they must constitute a long-term commitment of cash flow upon which the vendor can rely.

"The measure of recovery in case of default must correspond to those applicable to a normal commercial contract," he reminded the subcommittee.

Savings

M.S. Meeker, commissioner of automated data and telecommunications service of the GSA, said the General Accounting Office estimated savings that could be effected under the new bill, by converting installed inventory to multiyear leases, to be around $35 million in three-year leases and $75 million under five-year leases.

He pointed out that multiyear leasing will "have a dramatic effect on new equipment procurements as well . . . Similarly, maintenance services associated with long-term leases should be acquired at substantial savings because they will be for longer periods and under firm-term agreements."

Procurements should continue to be conducted through the ADP fund as the GSA "has a unique perspective on government-wide requirements. Acquisitions through the ADP fund are made with the useful life of equipment to the total government considered, including reutilization, not simply the requirements for one agency," Meeker said.

French Firm With 'Microcomputer' Seeks Tie-In With U.S. Firms

NEW YORK – A French company, complete with products made from U.S. components, is looking for a partner here to enter what it calls the microcomputer market.

The firm, Realisations Etudes Electroniques (R2E), has developed a system, based on the Intel 8008 chip, that sells for under $2,000 in a ready-to-use unit, with relatively low processing speeds and high input/output capability.

R2E said it is looking for arrangements with U.S. firms leading to non-exclusive production licenses with several major users, a joint venture with an American company or creation of a U.S. subsidiary, with its own production capability.

Production in the U.S. would reduce by almost half the expense of making the Micral unit, as almost all components come from the States.

Since its introduction in February 1973, over 700 orders have been received, the firm said.

Peripherals

Peripherals that can be attached to the Micral include printers, CRTs, floppy disks, cassettes, magnetic tape, 12M bytes of disk, card and paper tape readers and punches as well as process control connections.

Software developed includes an assembler language, a TTY monitor, floating-point library, utility programs and basic language, as well as some applications-oriented languages, the firm said.

The Micral is designed for process control, teletransmission, scientific instrumentation, instruction, and generally for real-time problems, the firm said.

The system is an 8-bit machine, with up to 16K bytes in direct addressing, which can be increased to 64K bytes, the firm said.

A Micral is equipped with up to 56 hardware interrupt levels, with up to seven channels. The average processing time of an instruction is 24 μsec.

The Micral will be exhibited at the National Computer Conference in Chicago, May 6-10.

IBM to Call Users, Executives

NEW YORK – IBM will rely heavily on users and its own executives for its defense in the massive antitrust suit against it by the U.S. Government, which is scheduled to start this October.

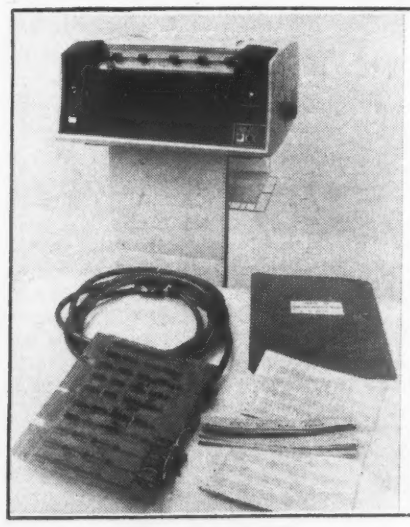
In its 21-page witness list – as contrasted with the one page of witnesses submitted by the government – IBM indicated it planned to call 88 computer users to the stand and 59 of its own executives for the case.

While the government witness list (see Page 41) relied heavily on testimony from other mainframe makers in the computer business, the IBM list of witnesses contained the names of only 17 firms related to data processing and primarily concentrated on service bureaus and software houses, even though one mainframer – Amdahl – is on the list.

IBM also indicated it planned to call about 21 witnesses from the university environment – primarily professors of electrical engineering or top administrators in the university environment with just a sprinkling of university computer users.

In the category of researchers or consultants in the DP field, the initial IBM witness list contains the names of five people.

IBM also said it would call five economists or accountants, including Carl Kaysen, now of Princeton's Institute of Advanced Studies, who wrote the economic brief in the precedent-setting United Shoe Machinery antitrust case.



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Aussies Seem Less Stringent On Offset Policy

SYDNEY, Australia – The government here seems less eager to exercise its offset rights, easing up on enforcement of its requirements for local components assembly or software development in Australia.

There has been no official change in offset policy, but a press conference held by Data General Australia (DGA) brought to light the new atmosphere, according to the *Australian Financial News.*

DGA announced it was not contemplating any moves to meet previously

International News

announced government prerequisites, a radical change from the company's announcement last year that it would consider performing some assembly here if it won big volume orders.

While DGA's visiting vice-president of marketing, Herb Richman, said his company "might consider" a factory in Australia when local turnover reached $30 million/yr, he added that "our interest is not in building rip-off factories to win contracts."

Last year, the *News* noted, Digital Equipment Corp. announced investigation into a local assembly plant and Honeywell and Burroughs said they would investigate local purchases in the DP component products line. Nothing more has been heard of these plans, the paper reported.

IBM is apparently the only company actively procuring local products.

Only the Defense Department, the *News* commented, is seeking to "strengthen Australia's expertise in what it considers strategic product and know-how areas." An upcoming contract for two large CPUs and software could, the paper said, be the only stimulus to keep alive offset policy at all.

Commerce Dept. Recruiting For Software Conference

WASHINGTON, D.C. – The U.S. Department of Commerce is currently recruiting manufacturers and service organizations to participate in a Computer Software Trade Mission to visit Belgium, The Netherlands and the Federal Republic of Germany.

Rising labor rates and growing energy problems are spurring European business to greater automation and more efficient use of existing computer installations, according to the department, which should mean excellent markets for U.S. software.

The mission will visit the three European countries June 13-27.

Further information on the mission is available from W. Bradley Tyrrell, Director, Computer Software Trade Mission, R6069, U.S. Department of Commerce, Washington, D.C. 20230.

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Singer Stresses Applications In Distributive Process Market

By Toni Wiseman
Of the CW Staff

SAN LEANDRO, Calif. – "We don't have total capability so we're not trying to compete with IBM. Our whole concept is the distributive process marketplace."

This, according to Louis B. Kavanaugh, director of systems marketing for Singer Business Machines, means that Singer is trying to provide large companies with processing capability in any division – be it manufacturing, process control or accounts receivable.

Kavanaugh describes Singer as "very applications-oriented." "Our primary orientation is toward what used to be turnkey systems and now have grown," he said, adding that Singer wants to provide small companies with applications packages and larger companies with the ability to get their data into the number crunchers.

Singer machines range from the non-intelligent 4300 Series through the 1500 intelligent terminal series to the System 10 computer.

For application software, Singer contracts with experts in the field, Kavanaugh said. Singer's philosophy "has been and will continue to be that we don't have the experience in-house to do application software."

In the next year, Kavanaugh foresees new applications for both the 1500 line and the System 10, concentrating on the growing areas of hospitals, manufacturing, state and local government, warehousing and libraries.

The main thrust of marketing for the 1500 is still data origination, with extensive editing, communication and file search capabilities. "We want some minimal types of applications by the end of this year," he said, "such as small payroll accounting, however."

The 1500, he indicated, is much more limited than the System 10 in terms of core size, input/output, etc., and is therefore restricted from multiprogramming. "But," he added, "it can do a competent job on applications which don't require complex applications."

POS Visions

Singer, Kavanaugh said, expects to maintain its position in the POS marketplace, with 50% of the market.

Along these lines, the company is test marketing a supermarket system which, he said, is a variation of the MDTS system.

It will be sold initially as a stand-alone unit which can be upgraded when the store is ready. Scanners for the system, he noted, are being developed both in-house and by outside sources.

CRT Market

Singer will also be introducing a new communications CRT later this year.

"In 1973 we averaged two workstations per System 10," Kavanaugh said. "Today we're seeing half a workstation and two CRTs per station."

The CRT market, he predicted, will be important for data entry and editing over the next few years, with improved terminals giving the remote user the same capability as the local user.

On the international scene, Kavanaugh predicted over 14% expansion for all products. "The international market is where the U.S. was two years ago," he said, "it's really beginning to grow."

Nonpayment Suit Filed Against Sorbus

CHICAGO – Data Replacement Service Co. has filed a nonpayment suit in Cook County Circuit Court here, asking for $8,127.36 in damages from Sorbus, Inc.

The amount claimed is the remainder of a $9,180 parts contract which, according to DRS owner Ross Di Giacinto, Sorbus broke without cause.

Sorbus stated that although it had heard of the possibility of a suit, it had not seen it.

The claim results from a purchase order signed in September 1973, wherein Sorbus ordered 6,000 punch supports for keypunches, subject to approval of samples.

Di Giacinto stated that Sorbus "in essence" accepted the samples since a check was received to cover partial shipment. No written confirmation of acceptance, however, was received.

A spokesman for Sorbus said the check was "sent in good faith under the assumption" that DRS would produce the parts in accordance with the purchase order terms.

The samples, he said, did not meet specifications. Sorbus also stated DRS failed to meet stipulated delivery dates.

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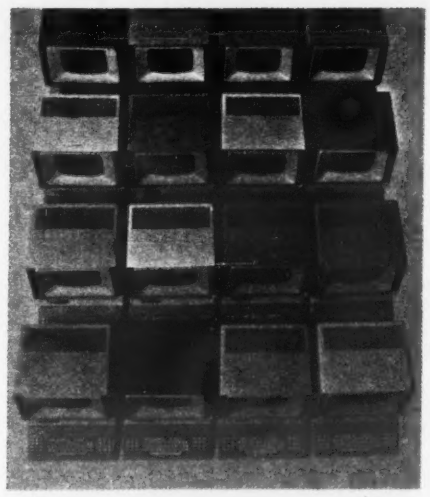

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'Stop the Buckpassing'

POS Users Demand Flexibility

By a CW Staff Writer

NEW YORK – "The buckpassing has got to stop; we need to have a way to identify the problem and the service organization responsible when POS systems go down," according to David Kratz, senior vice-president of finance and control at Abraham & Straus.

Speaking from the user's viewpoint at a recent IEEE Intercon session on point of sale here, Kratz illuminated several other needs of retailers, not the least of which is flexibility in a system.

A store requires its POS system to be operable by a typical retail sales person. And the store is willing to train the person in sales, but not in systems, he said.

The transaction must be a one-time, complete capture of all necessary information. The system should allow a quick interface to any on-line requirements such as credit authorization, ordering of goods or setting of delivery dates, he noted.

The system should be flexible to allow for handling a range of transactions. Kratz said stores cannot keep pushing their customers around from one station to another to complete verifications and other transactions.

POS has to provide the necessary information for optimal efficiency, such as inventory information and account reordering as well as the ability to track trends so the store can order in advance of customer demands.

Stores expect the POS vendor to recognize the real-time aspect of the system and make service available, he said.

Systems support should include basic software and application systems as well, Kratz said. The ideal would probably be standard packages with parameters selectable by the stores, for not every store wishes to operate in the same manner as every other retail establishment.

Setting up a system is not a one-time job, and the vendor should enable the store to react quickly to changing demands on the system.

Flexibility was also considered by Bill Orr, vice-president of Sweda International, as he examined where future POS systems may be putting intelligence.

Retailers are looking for increasing amounts of interaction between the terminals and the computer, he noted, such as for price lookups as well as for credit authorization and other instances of exchange of data and control.

Redundancy and flexibility are also becoming increasingly important considerations in system design, he added.

He qualified his phrase "dynamically distributed intelligence," by saying the intelligence and its location can change, if not dynamically, at least in time.

Some factors in system design include:

- The role of a read only memory (ROM) code.
- Size of alterable memory.
- Communications requirements.
- System generation. Does a vendor have to write custom software for every customer? How can this be done and still remain profitable, he pondered, adding the answer possibly lies in Kratz' suggestion of offering the stores parameters for their systems.

Universal Product Code Use May Aid Microscope Market

BUFFALO, N.Y. – The impending widespread use of the Universal Product Code in packaged goods has created a new market for measuring microscopes, according to Titan Tool Supply Co., Inc.

Although there are standard dimensions of the UPC symbol that will be "read" by scanners at the checkout stands, the actual size varies depending on the design, contents and overall size of the package itself, Titan noted.

To assure quality control and inspection of the printed impression, the packaging industry is using Titan's measuring microscopes to examine color contrast, evaluate density, gloss and other characteristics of ink.

DEC Has Module Mail Service

MAYNARD, Mass. – Digital Equipment Corp. has instituted a Module Mailer Program that enables OEMs to replace defective modules without a service visit from DEC.

The program should allow OEMs to maintain a smaller inventory of duplicate modules, a DEC spokesman said. Within 24 hours of receipt of the defective module, DEC will have a replacement on its way to the OEM.

Replacement modules available include CPUs for the PDP-8 family and the PDP-11/05 minis.

Orders & Installations

National Bureau of Standards has ordered Chi Corp.'s Programmable Display System (PDS) for installation on the Bureau's Univac-1108, to assist the operations staff in the tape-handling functions.

The New York State Board of Equalization and Assessment has ordered a Burroughs dual processor B6700 system and two B1700 systems, expanding currently installed Burroughs equipment for continuing development of a statewide real estate property information system.

Tribune Review **of Greensburg, Pa., has installed a Model 5100 OCR and a Model 5200 OCR from ECRM, Inc., as part of a conversion to cold-type operation in the composing room.**

United California Bank has ordered seven OCR-71 pocket machines from Optical Recognition Systems, Inc., for use in processing Micr document rejects.

Remote Computing Corp. has installed a Burroughs B6700.

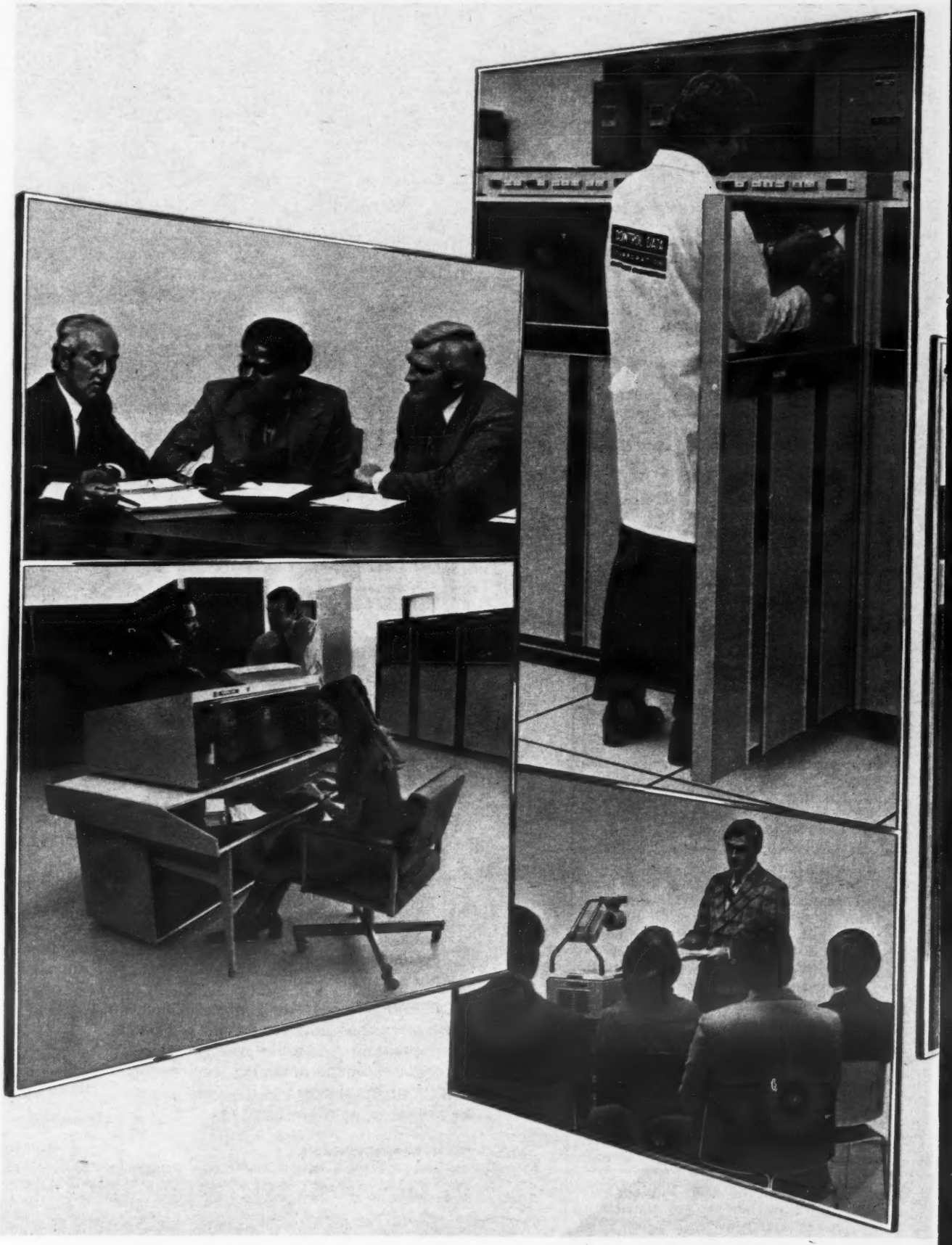
Harbison-Walker Refractories has purchased computer terminals from Data 100 Corp. The sales agreement involves 32 Model 88-23 terminals which the company had originally leased from Data 100 six months ago.

The Atomic Energy Commission has installed a Spur Products Corp. S1403/PDP-10 controller to obtain better print quality and greater character flexibility.

Western Electric, Allentown, Pa., has installed a computer automated test system from Systron-Donner Corp. to automatically trim silicon wafers.

Associated Dry Goods Corp. has ordered 550 mini point-of-sale terminals and related equipment from Datatrol Inc. to upgrade a Datatrol Credit Authorization System already operational.

Texas Instruments has installed an AED computer programming system from Softech.



DP Chiefs to Testify

NEW YORK – The government will rely heavily on the testimony of computer industry executives in its upcoming antitrust suit with IBM, according to a list of potential witnesses released here recently.

Well over half of the 42 potential witnesses are executives with mainframe makers or ex-mainframe makers as in the case of GE and RCA.

In addition, four economists (three from universities and one from the Justice Department) are on the lists, as are executives from five software firms, four former IBM employees and five government users.

While the list only includes personnel outside of IBM, it is believed the government will also rely heavily on testimony of IBM executives taken in pretrial depositions and in internal IBM documents in its effort to prove its monopoly and attempted monopoly charges against IBM in the general-purpose computer area.

The trial is scheduled to begin Oct. 7 in Federal District Court here.

IBM-U.S. Consent Decree Seen Possible

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – More and more computer industry figures are discussing the possibility of a consent decree between IBM and the government before their massive antitrust suit goes to trial as scheduled this fall.

And some of them are coming around to the view that a negotiated out-of-court settlement of the case is the most likely outcome at this stage, despite protestations by both sides to the contrary.

However the idea of a negotiated settlement is still seen as unlikely by many in the business.

A consent decree would be "the clearest means for IBM to resolve a problem of major magnitude," according to Tom Franklin, director of the IBM Litigation Reporting Service run by International Data Corp. and one of the main proponents of the consent decree viewpoint.

'Appalling' Consequences

The consequences of all the private suits faced by IBM as well as the consequences of trying the government suit before a judge that has already held the company in contempt "must be appalling," Franklin said.

The risks are high in the government action, Franklin noted, pointing out that a "victory" by the government could open the door to many private treble damage suits on the part of computer users – which potentially could bankrupt the firm.

Analysis

If IBM was found guilty of monopolization in the government suit, users could use the decision as prima facie evidence of monopoly.

Therefore, the users would just have to prove that they had been paying excessive prices caused by the monopoly.

While many business users might not make the effort in this area, several states have laws requiring their attorneys general to file such suits any time the government wins an antitrust decision on equipment used by the state.

In addition, a win by the government would also spur on the many private litigants against the firm within the computer industry, making it much harder for IBM to offer any of them low-priced cash settlements, sources indicated.

Franklin feels IBM will concentrate a great effort to get the Telex decision overturned on appeal, then work out a settlement with the government out of court, and begin negotiating with the private litigants on out-of-court settlements.

On the other hand, some industry figures feel the political climate might not be right for a consent settlement since the Justice Department is still smarting under criticism for its role in the ITT settlement.

'In Too Far'

"It seems to me," Jack Biddle, executive director of the Computer Industry Association, said, "that the Justice Department is too deeply committed to the case to accept a consent decree now.

"However," he added, "if IBM would propose a decree that would really solve the problems of concentration in the industry, then the Justice Department should accept it."

At the same time, Biddle said he felt such a move by IBM was doubtful.

Today, he added, "there is too much publicity for a quite weak consent decree to be negotiated between the parties as was the case with the decree hammered out between them in 1956."

Several other industry sources have indicated that if IBM were to go the consent decree route it might be to its advantage to wait as long as possible so the results of the appellate review of the Telex case would be known before negotiations were started with the government.

If this were the case, they indicated, IBM might try to delay the start of the government case in order to get more time to maneuver.

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Syntronic Instruments Acquires Cascade Data

EVANSTON, Ill. – Syntronic Instruments, Inc. has acquired Cascade Data, Inc. from Apeco Corp., which had earlier planned to terminate the activities of Cascade.

Syntronic plans to operate the company under the Cascade Data name, expand its product line and broaden distribution, a spokesman said.

Canada DP Census Available

TORONTO – The Canadian Information Processing Society has published the findings of the 1973 computer census in a paperback reference book.

Installed computers are listed by province, city, user and computer type, including such information as delivery date, main memory size, number of disk and tape drives and the status of the machine, rented, purchased or leased.

The 152-page census is available for $25 from The Canadian Information Processing Society, 42 Mercer St., M5V 1H3.

Beehive Recovers From Fire

SALT LAKE CITY, Utah – A weekend fire in the final assembly and test building of Beehive Medical Electronics, Inc. destroyed between 150 and 300 terminals, a spokesman for the firm said.

Within about 48 hours, the production line was up and functioning, and the firm anticipates it will be back on schedule within 30 to 45 days, he added.

Damage is estimated at about $1 million.

The cause of the fire is being investigated.

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Don't wait till the last minute. Now's the time to make sure your schedule includes a visit to the computer show that has already benefited more than 40,000 computer users in its first two years. Here are some of the details of our updated '74 program.

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The Computer Users' Forums give you a unique opportunity to exchange information with other users and independent experts about current practical problems. Forums run from 9:00 A.M. to 2:30 P.M. each day, including an opening report, panel discussions, morning and afternoon workshops and luncheon. If you register in advance for the User-to-User Forums, *you'll save $5 per day* from the price at the door. If you attend all three days, *you'll save $15*, just for acting early. (Note that no advance registration is required if you attend the Exposition only).

Here are the Forum topics for '74

First Day — **Source Data Automation Today**
with workshops on
Point-of-sale, Intelligent Terminals,
Optical Scanning and Off-Line Key Entry

Second Day — **Data Communications Update**
with workshops on
Network Planning, Front-End Processors,
On-Line Systems and Equipment Selection

Third Day — **Operations Management**
with workshops on
Performance Measurement, Project Control,
Multi-Vendor Installations and Small Centers

Free afternoon sessions

Each day an important, current topic is discussed in an open afternoon session at 2:45 P.M. — free to all Caravan attendees. In 1974 we'll be looking at:

FIRST DAY — Personnel
SECOND DAY — Data Communications
THIRD DAY — Data Base Design

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American Telephone & Telegraph Company • Anderson Jacobson, Inc. • Auerbach • BASF Systems • Beehive Medical Electronics • Boeing Computer Services, Inc. • California Computer Products, Inc. • Centronics Data Computer Corporation • Cincinnati Milacron • Complanco, Inc. • Computer Devices, Inc. • Computer Transceiver Systems, Inc. • Control Data Corporation • Cooke Engineering • Cullinane Corporation • Data General Corporation • Datapoint Corporation • Decision, Inc. • Delta Data Systems Corporation • Digital Equipment Corporation • Electronic Memories & Magnetics Corporation • General Automation • General Computer Systems, Inc. • Gould, Inc., Data Systems Division • Hazeltine Corporation • Hewlett-Packard Company • Incoterm Corporation • Interdata, Inc. • Intertel • International Communications Corporation, a Milgo Company • Lockheed Electronics Company • Modular Computer Systems • MSI Data Corporation • OMNITEC • Pansophic Systems, Inc. • Penril Data Communications, Inc. • Pertec Corporation • Prime Computer, Inc. • Quantor Corporation • Raytheon Data Systems • ScanData • Scope Data, Inc. • Shugart Associates • Software Sciences • Sperry Univac, Inc. • Stromberg DatagraphiX, Inc. • Sycor, Inc. • Texas Instruments, Inc. • Western Union Data Services Company •

Act now

If you'd like to attend The Computers Users' *Forums*, just fill out the registration form and send it in as soon as possible. Remember, advance registration for the Forums saves you $5 per day. If you wish to attend only the *Exposition*, no advance registration is required. Just mark your calendar for the city and dates you want to attend and come to the location indicated in the complete schedule.

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Please register me for the forum(s) indicated. I understand that this includes luncheon, workbook and admission to all three days of the Exposition. My check or purchase order is enclosed.
(No advance registration is required for the Exposition only.)

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Title _____

Company _____

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☐ Second Day — Data Communications Update
☐ Third Day — Operations Management

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☐ Chicago	Apr. 9-11	Hyatt Regency O'Hare
☐ Boston (Woburn)	Apr. 15-17	Northeast Trade Center (Rte. 128, Exit 39 or 40)
☐ Charlotte	Apr. 23-25	Charlotte Civic Center *
☐ New York	Apr. 30-May 2	Americana of New York

Total number of days registered _____ times $30=$ _____

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☐ *Purchase Order enclosed*

Registration at the door: $35 per day
Advance registration: $30 per day

For additional registrations, please copy this form.

*** Note: Earlier ads had incorrect location for Charlotte. Correct location for both Forums and Exposition is: Charlotte Civic Center, 101 South College Street**

Please circle one number in each category so that we may better serve you.

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02 Manufacturing — Computer or data system hardware/peripherals/other associated mechanical devices
03 Manufacturing (other)
04 Utilities/Comm. Sys./Transportation
05 Wholesale/Retail
06 Finance/Insurance/Real Estate
07 DP Serv. Bureau/Software/Planning
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09 Education/Medical/Legal
10 Federal, State and Local Government
12 Communications/Printing/Publishing
13 Other _____

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Dennis G. Sisco, Marketing Manager

Memorex '73 Loss $119.1 Million; Firm To Restructure Debt

SANTA CLARA, Calif. – Memorex Corp. posted a loss of 119.1 million for 1973 and revealed changes in restructuring of its debt.

In 1972, the firm earned $1.2 million or 30 cents a share. Revenues rose to $176.9 million in 1973 compared with $145.4 million in 1972.

Included in the loss were charges totaling $99.8 million, including $38.7 million in write-off of the MRX computer systems program; $37.4 million from an accounting change for R&D expenses and lease-acquisition costs.

There were also $20.9 million from a revaluation of assets and accelerated depreciation charges, and $2.9 million in other charges.

The firm said the other $19.2 million of the loss was mainly in worldwide equipment operations.

Auditors qualified the report on 1973 results subject to the effect of any adjustments that might result from litigation.

Memorex agreed in principle with senior lenders for conversion of $40 million of debt to preferred stock, other adjustments and a new $35 million line of credit.

The agreement is subject to Robert C. Wilson becoming chairman and president of Memorex.

Wilson, former president and chief executive of Collins Radio, is scheduled to assume these positions May 15, succeeding Laurence Spitters, whose resignation is effective April 26.

Memorex said the remaining debt to Bank of America and others total about $169 million, on which the interest rate is being reduced to 4% from 7-3/4% retroactive to July 31, 1973.

Wilson agreed to accept the position on condition of shareholder approval of new stock option plans and an employment contract, Memorex said. The firm added the Bank of America agreed to guarantee certain compensation provisions.

...Toward the Bottom Line

First-time dividends are being paid by **Electronic Tabulating Corp.**, annual dividend of 10 cents a share, and **Keane Associates**, a like amount as a special dividend.

$$$

California Computer has withdrawn a registration statement that became effective Dec. 17, covering 80,000 shares, of which 65,000 shares were sold.

$$$

Incoterm shares have been approved for listing on the American Stock Exchange.

$$$

The order backlog at **MSI Data** has reached $15 million.

$$$

Tektronix is paying a semiannual dividend of 10 cents a share on April 22 to shareholders of record March 25.

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#4 Delivery 5/17/74
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#6 Delivery 6/21/74

370/168 Model K

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#2 Delivery 6/21/74
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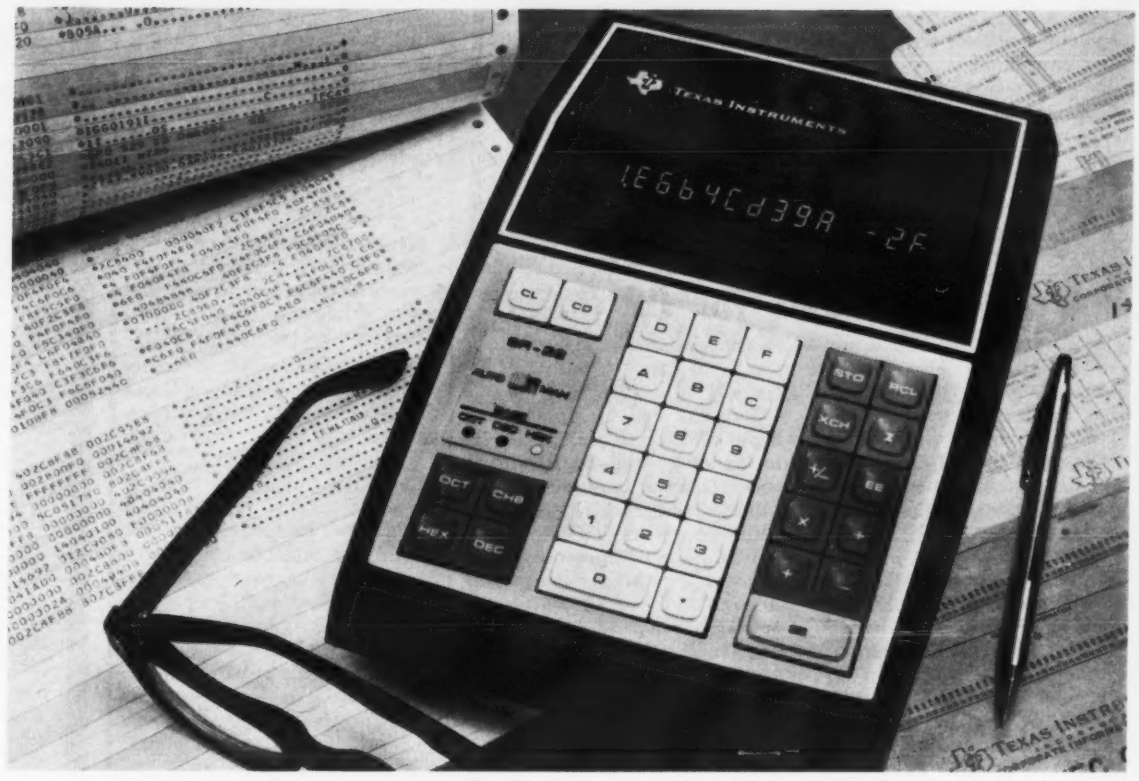
Analyze computer dumps faster, easier...

Texas Instruments SR-22 hexadecimal calculator/converter.



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Hexadecimal. Decimal. Octal. TI's SR-22 is the first electronic calculator/converter for computer programmers.

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Simply enter any number in base 8, 10, or 16. Then at the touch of a key, that number is converted to either of the other two bases. And when you need to add, subtract, multiply or divide, the SR-22 does the job – again in all three number bases.

An algebraic keyboard means easy data entry. Numbers are keyed in the same order you'd write them on paper. The SR-22 can handle numbers up to 10 digits, then automatically converts to scientific notation. And the SR-22's big, bright display clearly shows you 10-digit mantissa and 2-digit exponent (alphanumeric characters 0-9, A-F), signs, floating decimal.

The SR-22 lets you operate in either automatic or manual mode conversions. In the automatic mode, pressing the desired base key converts both the calculator display number and operation to the selected base. In the manual mode, you simply enter numbers in one base and then press one of the other two base keys. The calculator converts the entered number to the selected base and is ready for your next entry.

Versatile 3-base memory

You can store, recall and sum numbers with the SR-22's memory. Memory keys operate on the memory and display only, without affecting previous instructions. And all internal operations and data are converted to the selected number base upon recall. For example, when you enter a base 16 number and later recall it in base 10, the number is converted to display in base 10.

The SR-22 weighs less than two pounds. Measures only 6¼ x 8¼ x 2⅜ inches. From your desk it will operate on standard household current or 230V/50Hz common to Europe and South America. And if portable operation is required, you have the option of ordering a rechargeable Battery Pack.

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A deluxe padded vinyl carrying case is available to protect your SR-22 for $12.50.

Use the SR-22 for 15 days at no risk.

Mail this order form along with a check, money order, or company purchase order **only** for each unit(s) ordered. Use your SR-22 for 15 days, then if you're dissatisfied in any way, return it in the original carton along with all accessories for a full refund. Please add state and local taxes where applicable.*

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- ___Battery Pack(s) only $50.00 each (plus $2.00 postage and handling per pack ordered).
- ___Carrying Case(s) only: $12.50 each (plus $1.50 postage and handling per case ordered).

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Booths Booking Business

Exhibitors Say Caravan Good Sales Tool

By a CW Staff Writer

SAN FRANCISCO – The Computer Caravan is proving to be a handy selling tool, according to some exhibitors surveyed here.

Both of the software companies on the tour were pleased with the amount of business booked through their booths.

Cullinane Corp. found the show was exceeding its expectations. "We figured that about 1% to 5% of the people who would be coming to the Caravan might have some interest in our product," said John J. Cooper, program manager, "and we're finding that about a third of the people who stop by the booth are qualified or have a place in their business for our product."

Cooper also said the company was getting more and better leads than last year, adding, "We're getting a large number of prospects" attending the Cullinane seminars which are given in conjunction with the show.

Pansophic marketing representative John Adams stated his firm booked a contract on the floor to a local university. "We're getting good, qualified people, the technical types which is what we want," he said.

Boeing Computer Services, touring for its third year, found the crowds were bigger than in past years.

Digital Equipment Corp., which is promoting communications and business data processing equipment in its booth, said a number of users were seeking solutions to specific computer needs.

'Broad Base'

"We're seeing a broad base of customers," said David Bucknam, business products sales specialist, "scientific, educational, industrial and even some OEM."

"Good companies are represented by the attendees," said Carter Alexander, branch manager for MSI Corp. However, he commented that he hadn't seen "that many qualified decision-makers."

The major value for MSI and a number of other companies, he said, is in the total exposure. "People are getting to know who we are," said Alexander.

"We're getting primarily small users, and some larger prospects like telephone companies and time-sharing networks," said Floyd Riley of Cooke Engineering.

Over 95% of Caravan attendees are invited by exhibitors, Caravan registration director Edward Bloom estimated.

IBM Names Fellows for DP Roles

NEW YORK – IBM has honored six of its scientists for their contributions to computer science by naming them IBM Fellows.

The appointments will enable the six to pursue their own research interests for the next five years.

The new fellows are:

Charles F. Borteck, a design expert on system architecture for complex banking, communications and airline computer systems.

Harold Fleisher, who has done pioneering work in the field of array logic and has made contributions in the areas of computer logic, memory and optical switching devices.

Otto G. Folberth, who did much of the materials research that culminated in the development of the semiconductor memory.

Dean Eastman, an innovator in the application of photoemission to the study of surfaces to bring about a better understanding of some of the more esoteric electronic properties of solids.

John M. Harker, a pioneer in information storage device development and a major contributor to early disk file development and advanced magnetic bubble technology.

Benoit Mandelbrot, whose work in mathematics has uncovered probabilistic mechanisms that describe erratic fluctuations studied in the physical and social sciences.

To date, 56 people have been named IBM fellows.

Executive Corner

■ Darrell J. Lowrance and Leonard J. Eaton Jr. have been elected to the board of directors of The Mentor Corp.

■ Robert H. Bolman has been named to the board of directors of Computer Sciences Corp.

■ William G. Phillips has been made an outside director of Data 100 Corp.

■ Raymond E. Wakeman has resigned from Tymshare, Inc. to take a position as president and chief operating officer of Precision Instrument Co.

■ Gordon Perkins has been appointed president of Monolithic Systems Corp.

■ F. Allen Easterling has been elected president and Arthur G. Aery vice-president and controller of Randolph Computer Corp.

■ Thomas B. Martin has been named executive vice-president of Threshold Technology, Inc.

■ T.J. Smith has been named executive vice-president and Paul C. LaVoie vice-president, marketing of Sycor.

■ Thomas Allinson has accepted the position of vice-president of Datum, Inc.

■ Dennis J. Segreto has been elected vice-president of Datatron, Inc.

■ Frank A. Sola has been named a corporate vice-president by Keane Associates, Inc.

■ William A. Banks and George H. Enochs have been elected corporate vice-presidents of National Sharedata Corp.

■ Control Data Marketing Co. has appointed five regional sales managers to the position of vice-president. Those promoted include Herbert M. Hughes, eastern region; Roger A. Baldelli, midwest region; Alan R. Goad, southern region; Thomas W. Miller, western region; and W. Gary Glover, president and chairman of Control Data Canada, Ltd.

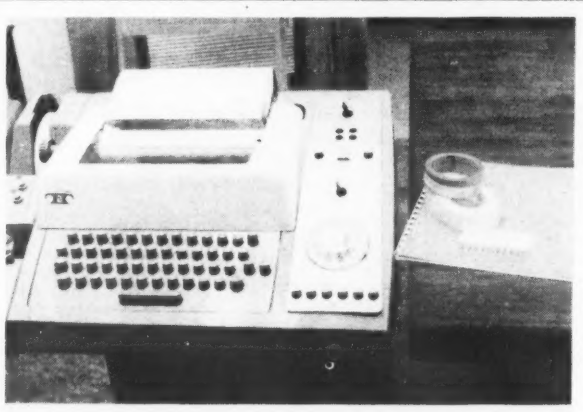
■ James A. Payne has been elected vice-president, field engineering of Harris Communications Systems, Inc.

■ Robert A. Kleist has been named vice-president, special programs of Pertec Corp.

■ George M. Minot has been made vice-president of national accounts of Compu-Serv Network, Inc.

■ Thomas M. Hoger of Boole & Babbage, Inc. has been appointed vice-president, engineering.

■ John H. Thrower has been elected to True Data Corp.'s new position of vice-president, manufacturing.



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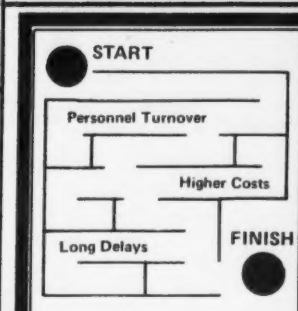

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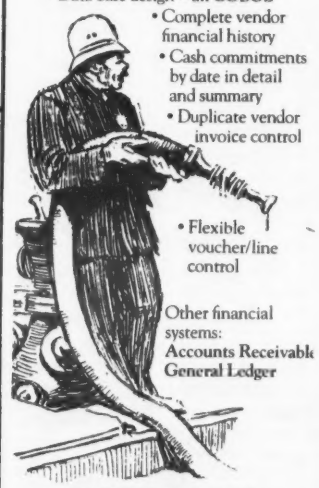

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'73 a Bit 'Wormy' for HP: Hewlett

By Molly Upton
Of the CW Staff

NEW YORK – The year 1973 "was a little bit on the wormy side" for Hewlett-Packard Co., although revenues and earnings increased over those of a year ago, President Bill Hewlett told a recent meeting of securities analysts.

Earnings rose 32% to $50.7 million or $1.89 a share compared with $38.5 million or $1.45 a share in 1972, while revenues grew to $673.4 million from $382.6 million.

"Any time you have an inversion of shipments and profits, that's a sign of a problem," he explained.

As of the end of the third quarter, shipments were up 34% and profit was up 38%, whereas the end of the fourth quarter showed shipments up 48% and profits up 38%. In 1972, profits rose 10%, but slowed to an 8.2% increase in 1973.

Part of the problem is that the fourth quarter catches all the corrections, but there were several unanticipated items, he added. Interest cost in 1972 was $350,000, whereas in 1973 it was $2.5 million.

"The worst thing of all was that all these items came as a surprise," Hewlett said, adding management has been studying operations closely.

Interest cost soared, because in one year the firm went from an almost zero borrowing position to a debt position of $114 million.

Two items, capital expenditures and asset management or accounts receivable and inventory, accounted almost completely for borrowing.

In 1972, HP had underbuilt and not kept pace with the firm's needs, he noted.

Aim to Cut Debt

Rather than proceed with plans to convert some of this borrowing to long-term debt, HP has decided it can, within two or three years, reduce the debt to a more manageable position.

The firm has already cut its debt position to $113 million from $132 million at the end of the first quarter, he said.

By the end of the year there should be a substantial improvement in inventory in relation to sales, Hewlett said.

HP managed to reduce its accounts receivable by $15 million, but its inventories rose $14 million.

Product lines are in much better shape than last year, with all major groups over the earnings targets, except medical, which is slightly under.

Although the Data Products Group's sales doubled during the year to $215.2 million from $108 million, and contribution to pretax earnings rose to $37.5 million from $21.4 million in 1972, the growth stemmed from the calculator side of the Data Products Group rather than from the computer and systems area, he noted.

Based on the "surprisingly strong" order rate from the international sector last year, HP seems to have raised its sales targets considerably for this year.

Last year international shipments were up 49% while profits rose 67%.

The worldwide order picture for the first four months of fiscal 1974 shows the rate is 7% over the target and 34% above those figures from last year. This puts domestic business 22% ahead and international 53% ahead of the 1973 figures, Hewlett noted.

For a short term, one-month glimpse, Hewlett said domestic orders for February were on target, and international orders were 11% below target, for an overall total of about 5% below target, or about 23% above last February.

Domestic orders for the month were 14% above last year's and international orders were 29% above those in February 1973.

For the first quarter ended Jan. 31, revenues rose to $191.7 million from $128.5 million a year ago and earnings jumped to $14.5 million or 54 cents a share compared with $8.7 million or 33 cents a share.

Incoming orders rose 39% over those of the same period in 1973 to $217.3 million. International orders totaled $108 million, up 59% from a year ago while domestic orders rose 24% to $109.2 million.

Hewlett said he would predict that the U.S. order picture would be slightly behind this year's target and last year's results, international would be further behind target but appreciably better than 1973. The overall picture would see orders running about 10% to 15% ahead of last year.

Acquisitions

TBS Computer Centers Corp. has been merged into NCSS Holding Co., Inc., a subsidiary of National CSS, Inc.

– – –

Creative Socio-Medics Corp. has become a wholly owned subsidiary of Advanced Computer Techniques Corp. CSM provides DP services to health care institutions.

– – –

The Foxboro Co. has agreed in principle to acquire Trans-Sonics, Inc. for stock. Trans-Sonics makes instrumentation systems primarily for marine transportation and off-shore energy exploration.

– – –

An agreement between Graphidyne Corp. and Comtrol, Inc. for the acquisition of Comtrol has been terminated.

– – –

Anacomp, Inc. has acquired Computer Micro Services, Inc., which has computer output microfilm centers in St. Louis, Kansas City and Milwaukee.

– – –

The Data Services Division of Comp-U-Check, Inc. has been acquired by 3 P.M., Inc.

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- How to upgrade to a bigger system.

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Dr. Dixon Doll leads the expert faculty at this seminar. He has his Ph.D. in Systems Engineering from the University of Michigan and many years of experience in this field as a consultant and educator. He has performed workstudy with communications techniques at M.I.T., taught graduate-level computer systems design, and has served as professional consultant to such firms as IBM, Raytheon, ICC and MCI. Dr. Doll is in charge of our faculty of experts, and takes an active part in the entire seminar.

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Earnings Reports

DOCUTEL
Year Ended Dec. 31

	a1973	b1972
Shr Ernd	$1.61	$1.78
Revenue	29,449,000	19,381,000
Disc Op	(1,156,000)	(41,000)
Tax Cred	1,948,000	2,025,000
Earnings	4,079,000	4,222,000
3 Mo Shr	.....	.81
Revenue	5,772,000	6,506,000
Disc Op	(590,000)	118,009
Spec Item	d653,000	c901,000
Earnings	(1,482,000)	1,881,000

a-Final report. b-Restated. c-Tax credit. d-Charge; tax adjustment.

DEARBORN-STORM
Year Ended Oct. 31

	a1973	a1972
Shr Ernd	.....	$1.85
bRevenue	$34,436,000	28,794,000
Disc Op	(13,005,000)	1,750,000
Earnings	(9,170,000)	4,990,000
3 Mo Shr	.....	.53
bRevenue	8,749,000	6,947,000
Disc Op	(9,336,000)	447,000
Earnings	(8,854,000)	1,430,000

a-Reflects the sale of the company's computer leasing division Feb. 1, 1974. b-From continuing operations.

GENERAL AUTOMATION
Three Months Ended Feb. 2

	1974	1973
Shr Ernd	$.37	$.34
Revenue	14,100,000	6,200,000
Tax Cred	.....	250,000
Earnings	927,000	726,000
6 Mo Shr	.72	.68
Revenue	26,135,000	12,064,000
Tax Cred	.....	586,000
Earnings	1,821,000	1,451,000

ON-LINE SYSTEMS
Three Months Ended Jan. 31

	1974	1973
Shr Ernd	$.46	a$.28
Revenue	2,493,385	1,599,998
Earnings	409,292	220,950
9 Mo Shr	a1.26	b.58
Revenue	6,859,297	4,550,605
Earnings	1,071,183	456,010

a-Adjusted to reflect a three-for-two stock split in March 1973.

TALLY
Year Ended Dec. 30

	1973	1972
Revenue	$13,189,000	$12,332,000
Spec Item	a945,000	b17,000
Loss	3,761,000	1,442,000

a-Debit; consists of charge from accounting change for research and development costs and loss from disposition of a division, partially offset by gain from foreign exchange transactions. b-Tax credit.

FOXBORO
Year Ended Dec. 31

	1973	1972
aShr Ernd	$1.67	$1.01
Revenue	166,097,515	149,905,941
Earnings	7,628,167	4,565,887
3 Mo Shr	.44	.48
Revenue	45,639,000	38,216,000
Earnings	1,992,000	2,175,000

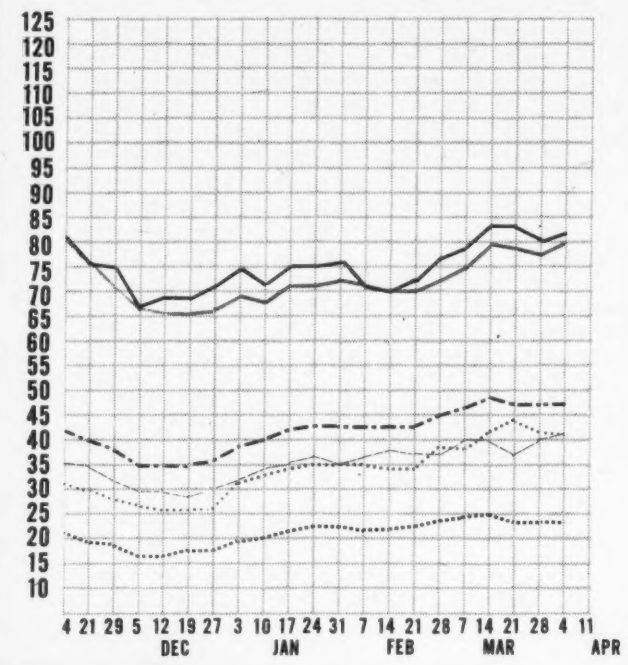
a-Excludes effects of unusual currency fluctuations, which amounted to a gain of $1.47 million in 1973 and a loss of $651,255 in 1972.

COMPUTER EQUIPMENT
Year Ended Dec. 31

	1973	1972
Shr Ernd	$.21	$.21
Revenue	27,546,000	20,789,000
aSpec Cred	99,000	216,000
Earnings	521,000	539,000

a-In 1973, principally from tax credit; in 1972, from tax credit and gain from retirement of long-term debt, less loss from previously discontinued operations.

COMPUTERWORLD Computer Stocks Trading Indexes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Computerworld Stock Trading Summary

TRADE*QUOTES

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

FXCH		1973-74 RANGE (1)	CLOSE APR 4 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	175-252	208 1/4	+3	+1.4
N	COLLINS RADIO	16- 26	24 3/4	0	0.0
O	COMPUTER AUTOMATION	5- 20	11 3/4	+1 3/8	+13.2
N	CONTROL DATA CORP	31- 62	33 1/2	+1	+3.0
N	DATA GENERAL CORP	22- 49	33 1/2	+3	+9.8
O	DATAPOINT CORP	10- 21	14	+ 1/4	+1.8
O	DIGITAL COMP CONTROL	2- 6	4 1/4	+ 7/8	+25.9
N	DIGITAL EQUIPMENT	73-121	106 1/4	-1 1/4	-1.1
N	ELECTRONIC ASSOC.	2- 9	2 3/4	0	0.0
A	ELECTRONIC ENGINEER.	6- 14	8 3/4	+ 1/8	+1.4
N	FOXBORO	23- 48	37 3/4	-1	-2.5
O	GENERAL AUTOMATION	22- 55	35 1/4	+3 3/4	+11.9
O	GRI COMPUTER CORP	1- 3	1 3/8	+ 1/8	+10.0
N	HEWLETT-PACKARD CO	70- 99	85 3/4	-1 3/8	-1.5
N	HONEYWELL INC	68-139	77 5/8	+1 7/8	+2.4
N	IBM	327-360	340 1/8	+ 3/8	+0.1
O	INTERDATA INC	7- 21	20 1/4	+2 1/4	+12.5
O	MICRODATA CORP	2- 10	3 5/8	0	0.0
N	NCR	27- 46	39 1/2	+2 5/8	+7.1
N	RAYTHEON CO	22- 39	33 3/8	-1 1/4	-3.6
N	SINGER CO	34- 74	34	-2 1/4	-6.2
N	SPERRY RAND	36- 56	39 3/4	+ 1/8	+0.3
A	SYSTEMS ENG. LABS	1- 8	2 1/8	0	0.0
N	TEXAS INSTRUMENTS	83-138	98	0	0.0
O	ULTIMACC SYSTEMS INC	1- 11	1 1/4	0	0.0
N	VARIAN ASSOCIATES	10- 20	9 7/8	-1	-9.1
N	WANG LABS.	13- 34	16 5/8	+ 5/8	+3.9
N	XEROX CORP	106-169	116 3/4	+1 5/8	+1.4
	LEASING COMPANIES				
A	BOOTHE COMPUTER	1- 5	1 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	+ 1/8	+6.2
O	COMDISCO INC	4- 17	4 3/4	0	0.0
O	COMMERCE GROUP CORP	3- 6	5 1/4	- 1/8	-2.3
O	COMPUTER EXCHANGE	1- 1	1/4	- 1/8	-33.3
A	COMPUTER INVSTRS GRP	2- 8	2 1/2	0	0.0
O	COMP. INSTALLATIONS	1- 2	3/4	0	0.0
M	DATRONIC RENTAL	1- 3	1 3/4	0	0.0
A	DCL INC	0- 3	1/2	-	-9.9
N	DPF INC	3- 9	3 5/8	- 1/4	-6.4
O	EDP RESOURCES	1- 3	3 1/4	0	0.0
A	GRANITE MGT	2- 6	2 1/8	- 1/4	-10.5
A	GREYHOUND COMPUTER	3- 6	4	+ 1/8	+3.2
A	ITEL	4- 12	5	+ 3/8	+8.1
N	LEASCO CORP	8- 18	10 5/8	- 1/8	-1.1
O	LEASPAC CORP	1- 8	1 3/8	0	0.0
O	LECTRO MGT INC	1- 2	3/4	0	0.0
O	NRG INC	3- 15	3 1/2	0	0.0
A	PIONEER TEX CORP	4- 8	3 3/4	- 1/8	-3.2
A	ROCKWOOD COMPUTER	1- 3	3/4	0	0.0
N	U.S. LEASING	16- 36	18	-2	-10.0

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EXCH		1973-74 RANGE (1)	CLOSE APR 4 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 1/8	0	0.0
A	APPLIED DATA RES.	2- 4	2	0	0.0
O	APPLIED LOGIC	1- 3	3/8	0	0.0
N	AUTOMATIC DATA PROC	39- 94	45 1/8	+ 5/8	+1.4
O	BRANDON APPLIED SYST	1- 1	3/8	- 1/8	-25.0
O	CENTRAL DATA SYSTEMS	3- 9	3 1/2	0	0.0
O	COMPUTER DIMENSIONS	1- 5	2	- 3/8	-15.7
O	COMPUTER HORIZONS	1- 6	3 1/2	0	0.0
O	COMPUTER NETWORK	1- 5	1 3/8	0	0.0
N	COMPUTER SCIENCES	2- 6	3 1/4	- 1/8	-3.7
O	COMPUTER TASK GROUP	1- 2	1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 3	1/2	0	0.0
O	COMPUTER USAGE	3- 9	3 1/2	- 1/4	-6.6
O	COMRES	1- 2	1/2	0	0.0
O	COMSHARE	2- 9	2 3/4	- 1/8	-4.3
N	CORNUCA CORP	3- 15	2 5/8	- 1/8	-4.5
O	DATATAB	1- 4	1 1/4	0	0.0
A	ELECT COMP PROG	1- 2	1/4	+ 1/8	+100.0
N	ELECTRONIC DATA SYS.	12- 56	15 3/4	-1 1/2	-8.6
O	INFONATIONAL INC	1- 2	1/2	+ 1/8	+33.3
O	INFORMATICS	2- 7	6 3/4	0	0.0
O	I.O.A. DATA CORP	1- 1	3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 5	1 1/4	0	0.0
O	KEANE ASSOCIATES	2- 5	3 3/4	- 1/4	-6.2
O	KEYDATA CORP	4- 12	4 3/4	+ 1/8	+2.7
O	LOGICON	2- 7	4 3/8	+ 1/8	+2.9
A	MANAGEMENT DATA	1- 5	1 5/8	- 1/4	-13.3
O	NATIONAL CSS INC	18- 42	27 1/2	-2 1/2	-8.3
O	NATIONAL COMPUTER CO	1- 1	3/8	- 1/8	-25.0
O	NATIONAL INFO SRVCS	1- 2	1/8	0	0.0
P	ON LINE SYSTEMS INC	12- 29	26 3/8	- 3/8	-1.4
N	PLANNING RESEARCH	2- 7	2 5/8	+ 1/8	+5.0
O	PROGRAMMING METHODS	17- 25	17	0	0.0
O	PROGRAMMING & SYS	1- 1	1	0	0.0
O	RAPIDATA INC	2- 24	3 3/8	- 1/8	-3.5
O	SCIENTIFIC COMPUTERS	1- 3	1	+ 1/4	+33.3
O	SIMPLICITY COMPUTER	1- 4	1	- 1/8	-11.1
O	TCC INC	1- 1	1/4	0	0.0
O	TYMSHARE INC	6- 13	9 1/2	- 1/8	-1.2
O	UNITED DATA CENTER	3- 6	3 3/4	0	0.0
A	URS SYSTEMS	2- 8	3	0	0.0
N	WYLY CORP	3- 11	3 3/4	- 1/8	-3.2
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	9- 34	9 3/8	- 1/4	-2.5
O	ADVANCED MEMORY SYS	4- 23	4 3/4	0	0.0
N	AMPEX CORP	3- 7	3 7/8	- 1/8	-3.1
O	ANDERSON JACOBSON	2- 6	3	- 1/2	-14.2
O	BEEHIVE MEDICAL ELEC	4- 10	4 3/4	- 1/4	-5.0
A	BOLT,BERANEK & NEW	6- 12	7 1/2	- 1/8	-1.6
N	BUNKER-RAMO	6- 18	7	+ 1/8	+1.8
A	CALCOMP	5- 16	9 1/2	+ 1/8	+1.3
O	CAMBRIDGE MEMORIES	8- 17	11 3/8	+ 7/8	+8.3
O	CENTRONICS DATA COMP	13- 38	20 1/4	+1 1/4	+6.5
O	CODEX CORP	8- 19	12	- 3/4	-5.8
O	COGNITRONICS	1- 3	7/8	+ 1/8	+16.6

FXCH		1973-74 RANGE (1)	CLOSE APR 4 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER COMMUN.	1- 4	1	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER MACHINERY	4- 13	4 7/8	+ 1/2	+11.4
O	COMPUTER TRANSCEIVER	1- 6	1 1/8	- 1/8	-10.0
N	CONRAC CORP	13- 32	18 7/8	+2 3/8	+14.3
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	9- 19	10 1/4	- 1/4	-2.3
A	DATA PRODUCTS CORP	2- 5	3 3/4	+ 1/8	+3.4
O	DATA RECOGNITION	1- 3	1/2	0	0.0
O	DATA TECHNOLOGY	1- 5	3 1/4	- 1/8	-3.7
O	DECISION DATA COMPUT	6- 40	11 1/2	+ 1/4	+2.2
O	DELTA DATA SYSTEMS	1- 1	7/8	0	0.0
O	DYMAN CONTROLS	1- 4	1 3/4	0	0.0
N	ELECTRONIC M & M	3- 6	3 1/4	- 1/8	-3.7
O	FARRI-TEK	2- 5	2 5/8	0	0.0
O	GENERAL COMPUTER SYS	3- 9	3	0	0.0
N	GENERAL ELECTRIC	51- 76	56	+1 3/4	+3.2
N	HAZELTINE CORP	4- 9	5 3/8	+ 3/8	+7.5
O	INFOREX INC	3- 23	2 7/8	0	0.0
O	INFORMATION DISPLAYS	1- 2	1/2	0	0.0
O	INFORMATION INTL INC	8- 15	9 3/4	- 1/4	-2.5
A	LUNDY ELECTRONICS	3- 9	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/4	- 1/8	-33.3
N	MEMOREX	2- 19	3 3/4	+ 1/2	+15.3
A	MILGO ELECTRONICS	14- 28	15 1/2	+ 3/8	+2.4
N	MOHAWK DATA SCI	2- 13	3 1/2	- 1/4	-6.6
O	ODEC COMPUTER SYST.	2- 6	2	0	0.0
O	OPTICAL SCANNING	2- 8	3 1/2	+ 1/2	+16.6
O	PERTEC CORP	3- 8	3 5/8	- 1/4	-6.4
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	2- 9	3 3/4	+ 1/8	+3.4
O	PRECISION INST.	2- 6	1 3/4	0	0.0
O	QUANTOR CORP	4- 10	6	- 1/2	-7.6
O	RECOGNITION EQUIP	2- 8	3	- 1/8	-4.0
N	SANDERS ASSOCIATES	6- 18	5 7/8	- 1/8	-2.0
O	SCAN DATA	1- 6	2	- 1/8	-5.8
O	STORAGE TECHNOLOGY	11- 34	13 5/8	+1	+7.9
O	SYCOR INC	9- 20	9	-1	-10.0
O	TALLY CORP.	2- 14	4	+ 1/8	+3.2
O	TEC INC	5- 9	6 1/4	+1	+19.0
N	TEKTRONIX INC	30- 55	41 1/2	- 1/2	-1.1
N	TELEX	3- 8	2 7/8	+ 1/8	+4.5
O	WANGCO INC	7- 13	11 3/4	+ 3/4	+6.8
O	WILTEK INC	6- 18	6 1/2	+ 1/2	+8.3
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 9	5 1/4	0	0.0
A	BARRY WRIGHT	5- 13	7 1/8	+ 1/2	+7.5
O	CYBERNATICS INC	1- 3	1 3/8	+ 1/8	+10.0
A	DATA DOCUMENTS	17- 36	36	+3 3/4	+11.6
O	DUPLEX PRODUCTS INC	6- 10	9 1/2	- 1/4	-2.5
N	ENNIS BUS. FORMS	5- 8	6 1/4	- 1/4	-3.8
O	GRAHAM MAGNETICS	7- 20	9	0	0.0
O	GRAPHIC CONTROLS	7- 12	10 3/4	+1 1/4	+13.1
N	3M COMPANY	69- 91	75 3/8	+ 5/8	+0.8
O	MOORE CORP LTD	49- 65	49	- 1/2	-1.0
N	NASHUA CORP	35- 58	35 1/2	-2 1/2	-6.5
O	REYNOLDS & REYNOLD	25- 51	27 1/2	-1	-3.5
O	STANDARD REGISTER	11- 20	14	- 1/2	-3.4
O	TAB PRODUCTS CO	7- 23	10	+1 1/2	+17.6
N	UARCO	15- 23	19 1/8	- 3/8	-1.9
A	WABASH MAGNETICS	5- 8	6	- 1/8	-2.0
N	WALLACE BUS FORMS	14- 26	18 5/8	+ 1/2	+2.7

CIG 145 Memory:

Top Line Features. Bottom Line Price.

1 PLUG-IN UPGRADES

Need more memory? Plug it in. Each of the eight Basic Storage Modules (BSM's) of the CIG system can accept up to 256K bytes of plug-in semi-conductor memory. So when you need more memory, you'll get it. Fast.

2 DOUBLE CAPACITY

IBM: One meg
CIG: Two meg's
The CIG/145 has dual gates each of which contains up to a full megabyte of main memory. Up to 2,048K bytes in one compact unit. CIG's double capacity. Twice the memory IBM can give you.

3 MODEL CHANGES

Every CIG/145 memory system includes the proper model change required to upgrade your 145 CPU to its new storage capacity. So you save twice. Once on the memory system. Once on the model change. Both from CIG.

4 REALLOCATION

The CIG/145 will reallocate any segment of main memory in 128K increments. So if you do have a problem, you move it where it hurts you least. In fact, your CIG/145 system will even cover-up for failing IBM memory. All under operator control.

5 INVISIBLE MEMORY

Throw a switch and we'll disappear. Really! CIG's on-line/off-line switch will make your 145 think its CIG memory was never there. So if IBM has a problem, they can't point at us, 'cause they can't find us. We're invisible!

6 ECCL

CIG's Error Checking and Correction Logic. It keeps your system up even if the chips are down. In fact, the CIG/145 can continue to operate with an entire 32K bit memory card out. Because each card contributes only one bit per word. And our ECCL automatically corrects all single bit errors.

7 FOUR LEVEL DIAGNOSTICS

The CIG/145 allows four levels of integrated diagnostic support: 1) Off-line operation from the integral test panel. 2) Execution of CIG stand alone diagnostics. 3) IBM and CIG microdiagnostics executed from the 3145's microinstruction processor. 4) IBM on-line diagnostics such as OLTEP (Online Test Executive Program) and ASCP (Automatic System Checkout Program).

IBM offers only the last two levels of diagnostic support, both of which require use of the central processor to execute.

Which means your operations stop when IBM's diagnostics start.

8 SERVICE

We're memory specialists. So if your CIG memory system ever does require service, you get a CIG memory expert. Not a generalist like IBM might send. Your CIG memory spares are on-site, too. Not at some remote depot. That's one of the ways we keep 650 CIG memory customers happy.

9 PACKAGE LEASING

CIG not only gives you 145 memory, we can lease you the mainframe and all your disc and tape peripherals to boot. That way you get everything from one source. All the equipment. And all the savings.

10 CIG/145. ITS BEST FEATURE IS US.

As we said before, you don't keep 650 memory customers happy by being charming. You keep them happy with innovative products backed by solid performance and service.

CIG is the world's leading independent memory supplier with sales, service, and systems engineering support available throughout the United States, Canada and Europe.

In addition to our 360/370 and Univac memory systems, other CIG products and services include 360/370 package leasing, plug-compatible block multiplexer and selector channels, and IBM plug-compatible disc and tape I/O subsystems. What we've done for other people, we know we can do for you. Check us out. And call us in.

CIG

CIG COMPUTER PRODUCTS, INC.

A Subsidiary of Computer Investors Group, Inc

1351 Washington Blvd., Stamford, Conn. 06902

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☐ I'd like to check your prices. Have your rep call me at_____

☐ Send a copy of "Add on Memory for the 370/145."

☐ Send info on other CIG Memory for the 360/_____, 370/_____

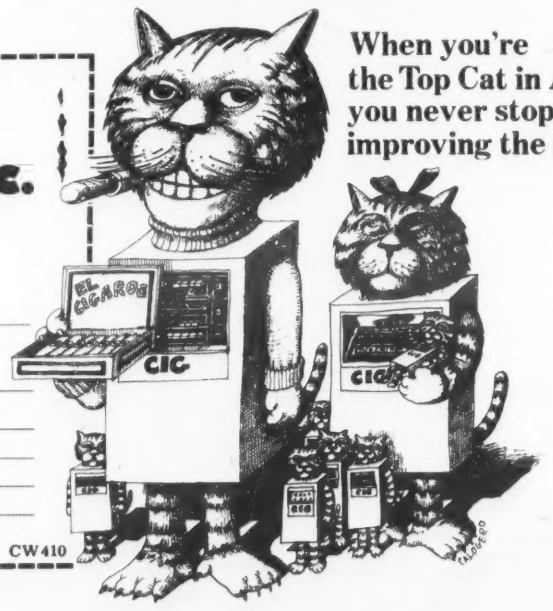
Name_____ Title_____

Company_____

Street_____

City_____ State_____ Zip_____

CW410



When you're the Top Cat in Add-On Memory, you never stop improving the breed.